The NEW ZEALAND JOURNAL OF AGRICULTURE

Vol. 62 WELLINGTON, MARCH 15, 1941 No. 3

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Possibilities of Farm Production

Stock-taking Discloses Healthy Position

By

R. P. CONNELL,
Land Utilisation Officer,
Wellington.

This article, which has been extracted from a report presented to the National Council of Primary Production, is a survey of some of the major farming resources of the Dominion. The report was drawn up as a guide to the Council in formulating its production programme for the 1941-42 season, and was supplemented by a review of New Zealand's farming achievement during the 1914-18 war.

APART from farm man-power, which is not considered in this stock-taking of our farming activities, there is every indication that the stage now is better set than ever before for heavy farm production.

The main facts supporting this finding are:—

Area Farmed.—Taking into account its area and condition, the capacity of the land being farmed is at its peak point in our history. This is due primarily to the record total area under cultivation, which has been constantly increasing in recent years, and has more than counter-balanced any other changes which have taken place in the total area of land occupied. In Table 1 (see page 146) is given an indication of changes in the area and use of occupied land during the period 1929-39.

The most significant figures relate to the total area in cultivation, which embraces, among other things, not only root and forage crops, but also sown grasses, orchards, horticultural areas, and timber plantations. Though the total occupied area has declined by 203,000 acres during the last five years for which figures are available, the area in cultivation has increased by 219,000 acres in the same period. This increase outweighs the decline in occupied area to a greater degree than a comparison of the figures only would suggest.

Grassland Position.—The grassland position is stronger than at any previous stage in our history. Two factors have contributed dominantly to this result:—

(1) An extensive programme in recent years of replacing worn-out pastures or other inferior vegetation by permanent pastures, in which better strains of important pasture species have been used.

(2) A pasture topdressing programme which in the last five years has been heavier and more extensive than any carried out previously.

In view of the possible influence on future fertiliser supplies of the recent enemy action at Nauru, the momentum given to our pasture vitality by heavy recent topdressing promises to be particularly valuable. If it is associated with suitable grazing and adequate feed conservation, it will allow production to be kept up for quite an appreciable period at a higher level than it could have been maintained had recent topdressing been on a scale equal to that before 1935.

A strong grassland position is especially valuable in war economy as it enables us for the time being to produce with relatively small expenditure, grass returns which may approximate or even exceed those which could be obtained by arable operations.

In round figures, 5,900,000 acres have been sown in pastures during the last 10 years. It is probable that about two-fifths of this sowing would occupy the land only temporarily, leaving a sowing of about 3,500,000 acres in permanent pastures. Because of the variations in the seed sown these pastures would vary from poor to indifferent to good, but during the last eight of the ten years under review the position was stronger than at any time previously.

This is due to the initiation of certification of pasture seed as a result of which approximately half the area sown in permanent pasture in the past eight years has been sown in superior strains of perennial ryegrass, the species of major importance. These pastures respond more to good grazing practice and to topdressing than inferior swards.

TABLE 1.

Year.	Total Area in Cultivation.	Area in New Zealand Flax.	Tussock and Native Grasses.	Fern, Scrub and Second Growth.	Standing Virgin Bush.	Barren and Unproductive Land.	Total Unimproved Occupied Land.	Total Occupied Land.
1929	19,118,101	62,704	14,131,630	4,016,774	3,883,805	2,309,117	24,404,030	43,522,131
1930	19,156,074	68,260	14,182,142	3,980,643	3,757,421	2,224,113	24,212,579	43,368,353
1931	19,006,878	91,219	14,124,030	4,149,710	3,523,157	2,344,591	24,232,707	43,239,585
1932	18,849,601	77,437	14,294,463	3,966,790	3,472,657	2,067,801	23,879,148	42,728,949
1933	19,033,625	64,206	14,137,375	4,000,229	3,419,305	2,018,654	23,639,769	42,673,394
1934	19,186,748	72,853	14,014,177	4,015,444	3,369,551	1,984,135	23,456,260	42,643,008
1935	19,502,519	72,823	14,184,044	4,179,763	3,284,154	1,881,256	23,602,040	43,104,559
1936	19,671,558	68,933	14,242,407	4,205,825	3,299,423	1,793,947	23,610,535	43,282,093
1937	19,588,006	63,015	14,188,184	4,365,054	3,192,165	1,803,469	23,611,887	43,199,893
1938	19,691,001	66,515	14,015,112	4,393,387	3,038,284	1,956,390	23,469,688	43,160,689
1939	19,721,949	57,602	13,822,137	4,387,367	2,923,043	1,989,174	23,179,323	42,901,272

The following table shows the trend of topdressing on grassland:—

TABLE 2—
USE OF FERTILISERS.

Year.	Total Quantity Used (tons)	Total Area of Grassland Topdressed (acres)
1929	504,000	2,650,748
1930	398,000	2,871,316
1931	354,000	2,454,321
1932	430,000	2,438,114
1933	416,000	2,249,170
1934	425,000	2,684,114
1935	461,000	2,882,224
1936	538,000	3,326,279
1937	632,000	3,873,989
1938	626,000	4,016,944
1939	714,000*	4,187,284
1940	702,000†	

* Blood and bone (estimated).
† Estimated.

The trend as indicated in Table 2 by the figures for the 10 years 1930 to 1939 inclusive is interesting. There was an increase of 80 per cent. in the fertiliser used and an increase of 45 per cent. in the acreage of grassland topdressed. This points to a substantial increase in the average weight of the fertiliser dressing applied to each acre of grassland. The validity of this conclusion is not affected by the quantity of fertiliser used on arable crops because the area devoted to such crops is but a fraction of the area of grassland topdressed. In addition, any increase in the amount of fertiliser applied per acre to such crops would be offset totally or largely by the decline in the total acreage of such crops, which latterly has been about 200,000 acres less annually than it was in the early part of the period under consideration.

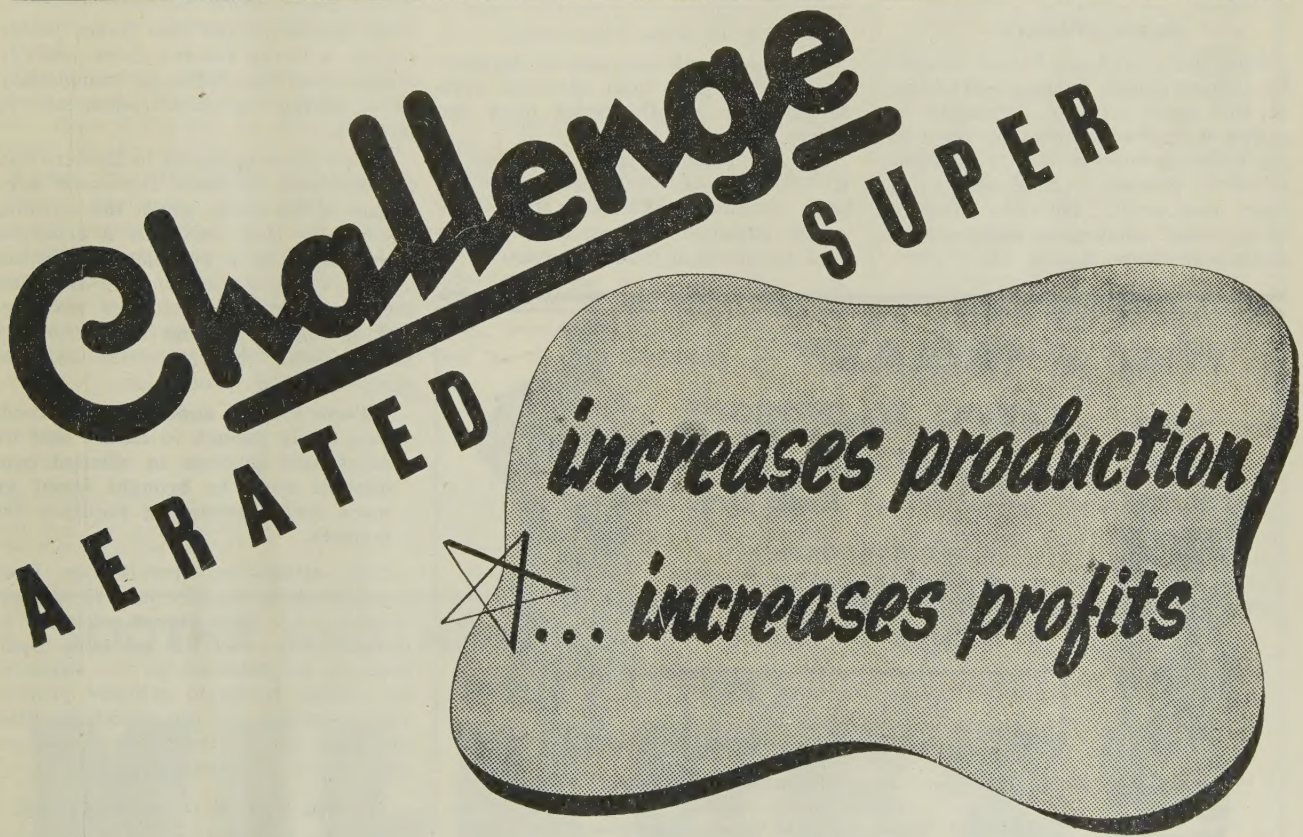
A careful official estimate of the Dominion's requirements of fertiliser for arable crops is 135,000 tons annually. Assuming this requirement to have been constant during the period under discussion then the average fertiliser dressing applied to grassland was $1\frac{3}{4}$ cwt. per acre in 1931 and the corresponding figure for 1939 was $2\frac{3}{4}$ cwt. per acre—surely a rapid advance in the intensity of grassland topdressing.

FARM POWER.

The amount of farm power in the form of tractors and horses is set out in the following table:—

TABLE 3.

	Horses.		Tractors.	
Year.	Draught and ¾ Draught.	Total.	Number.	Horse-power.
1930-31	133,044	295,743	5,023	79,129
1931-32	121,594	267,980	4,856	74,589
1932-33	120,136	263,883	4,972	78,024
1933-34	119,454	260,892	5,062	79,884
1934-35	120,239	259,972	5,349	84,867
1935-36	122,749	263,156	5,710	94,905
1936-37	124,111	264,785	6,585	112,007
1937-38	124,837	265,153	8,030	139,267
1938-39	123,594	261,789	9,639	166,005
1939-40	122,245	258,567	11,284	203,403



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Not only is the supply of power greater at present than at any other period, but it is also more flexible and more adapted to the restricted supply of man-power. This is due to the substantially increased role played by tractors.

The farm power position as reflected in horses and tractors is adequate for a greater programme of work than will be assigned to it.

It is significant that in 1938-39, the latest season for which figures are available, the area in arable crops was appreciably less than on previous occasions when the supply of farm motive power was substantially smaller. For example, in 1932-33, the area in arable crops was 350,000 acres greater than in 1938-39, when the number of draught horses and the number of tractors on farms were both greater. As there has been no material change in the meantime, it is clear that New Zealand has a big reserve of farm motive power. This conclusion is valid even though no account is taken of the considerable extent to which the truck has replaced the horse in farm work.

TABLE 4.—F.O.B. VALUES (N.Z.£) OF MAIN PRIMARY PRODUCTS.

	1935-36	1936-37	1937-38	1938-39	1939-40
Butter	14,878,000	17,594,000	18,458,000	15,316,000	18,162,000
Cheese	4,468,000	5,917,000	6,146,000	5,186,000	7,361,000
Pork	1,508,000	1,631,000	1,885,000	1,686,000	1,734,000
Mutton, Lamb and Beef	10,410,000	11,616,000	13,560,000	12,683,000	15,672,000
Wool	12,762,000	18,771,000	12,326,000	12,899,000	14,664,000
TOTAL	£43,026,000	£55,529,000	£52,375,000	£47,770,000	£57,593,000

TABLE 5—TRADING BANK ADVANCES TO PRIMARY PRODUCTION INTERESTS. (Expressed in £N.Z. thousands for year ended last Monday of June quarter).

	1936	1937	1938	1939	1940
(1) *Bank Advances to Farmers—*					
(a) Mainly dairy	4,988	5,101	5,445	5,380	5,013
(b) ,, wool	5,907	5,368	6,255	6,288	5,769
(c) ,, meat	2,199	1,925	2,151	2,206	1,937
(d) ,, agricultural	297	322	340	372	264
(e) Mixed	4,295	4,058	4,627	4,438	4,273
TOTALS	17,686	16,774	18,817	18,684	17,255
(2) *Bank Advances to Industries Allied to Primary Production—*					
(a) Dairy Companies, Factories, etc.	1,199	1,279	1,308	1,505	2,528
(b) Freezing Works, Meat Companies, etc.	865	852	1,707	2,846	2,969
(c) Woollen Mills	276	386	603	447	215
(d) Other	1,552	1,652	2,013	1,661	1,463
TOTALS	3,892	4,169	5,630	6,460	7,176
(3) *Bank Advances to Stock and Station Agents*	726	688	1,232	1,331	587
TOTAL ADVANCES OF ALL CLASSES	£44,785	47,175	54,305	54,422	46,909

FARM FINANCE.

Some light on farm finance is given by a consideration of the export values of the main primary products, together with the advances by the trading banks to farmers, and to industries allied to primary production such as dairy companies, factories, freezing works, meat companies, woollen mills, stock and station agents, etc.

Points from these tables are:—

(1) When bank advances to farmers were at their peak these advances were 35 per cent. of all trading bank advances.

(2) At present despite a decline of £1,400,000 from the peak figure in bank advances to farmers these advances represent 37 per cent. of the total advances of trading banks.

(3) Twice in the five years under review a heavy income from primary produce has been followed immediately by a decline in bank advances to farmers.

As the bank advances to farmers and to associated interests represent only a part of the credit given the farming community they serve as a criterion rather than as a complete indication of the whole position. As a criterion they may be interpreted as not suggesting any hampering restriction in farm credit which would militate against efficient production.

Farm finance appears to be available freely enough to ensure that no substantial increase in efficient production could be brought about by more ready borrowing facilities for farmers.

This satisfactory result has been brought about mainly by (1) the relatively high gross farming income of the past four years; (2) the farm credit position, as reflected in the advances by trading banks to primary production interests; (3) the credit facilities available under the Farmers' Loans Emergency Regulations 1940.

MAJOR TYPES OF LIVESTOCK.

The number of dairy cows and sheep is set out in the following table:—

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CANVAS WATERPROOF
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Keep Dry!

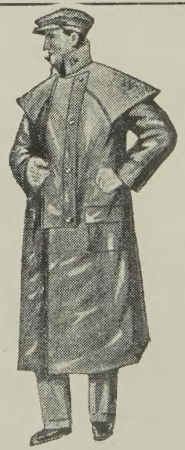
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TABLE 6.

Year.	Total dairy cows in milk and dry.	Dairy heifers one year and under two years old.	Dairy heifers under one year.	Breeding ewes.	Total sheep.
1930-31	1,601,633	346,156	370,697	17,608,729	29,792,516
1931-32	1,702,070	365,357	360,691	17,063,060	28,691,788
1932-33	1,845,972	359,697	380,244	17,219,697	27,755,966
1933-34	1,932,511	365,126	379,030	17,571,426	28,649,038
1934-35	1,952,094	364,081	330,532	17,812,417	29,076,754
1935-36	1,951,507	322,757	287,662	18,668,961	30,113,704
1936-37	1,935,524	291,810	331,277	19,332,077	31,305,818
1937-38	1,872,797	322,941	328,215	19,663,866	32,378,774
1938-39	1,853,713	321,657	333,870	19,960,299	31,897,091
1939-40	1,850,071	—	—	19,727,651	31,061,875

The figures for pigs are not given because they provide but a very indifferent guide to future production. An interesting feature of the breeding ewe position is that 1940 was marked by a slight increase in the North Island number in comparison with 1939. Hence, the falling-off in the Dominion total is due solely to decreases in the South Island, which took place in all districts, but mainly where snow in the high country affected the position.

The livestock position is fully consistent with the production of meat, cheese, wool, and butter being maintained at or about the current high level.

The breeding ewes continue quite strong numerically and the data available does not point to any radical change in the number of dairy cows.

FARM PRODUCTION—1914-1918.

New Zealand's achievement in primary production during the war of 1914-1918 gives some confidence and encouragement in the consideration of our production in the immediate future. In those years production was practically maintained throughout, and there was no depletion of livestock or the total area devoted to farming.

In table 7, if one cattle beast is taken as equivalent to six sheep then the total number of livestock units was greater at the end of the period, while the area in occupation and the area in grass both materially increased.

To sum up, important features of the farm production of the 1914-1918 war period were:—

(1) During the war and the two years following the war the quantity of farm produce available for export annually was appreciably greater than that available in the two years preceding the war.

(2) Contemporaneously, there took place substantial increases in (a) total number of farm livestock (b) total area occupied (c) total area in grass.

In some important respects farm man-power was a greater factor in production than it is today. This may be accounted for partly by the distinct labour economy in the production of feed by topdressing which plays a much greater part in our farming than it did 25 years ago and partly by the fact that our farming has become more mechanised during the last quarter-century through the use of tractors, trucks, improvement of milking machines, and modern labour-saving harvesting equipment.

TABLE 7.

	1913-14	1918-19	1919-20
Total dairy cows in milk or dry at January 31	701,312	826,135	903,454
Total cattle at January 31	2,249,956	3,035,478	3,101,945
Total sheep and lambs at April 30	24,798,763	25,828,554	23,919,970
Total area occupied (acres)	40,926,875	43,342,706	43,473,079
Total area in grass (acres)	30,012,900	30,679,900	30,813,300

A RATHER serious loss of sheep was found on investigation to be due to the black-leg organism, states the annual report of the Director of the Livestock Division. The results obtained from the vaccination of the flock against black-leg have been very satisfactory. The vaccine used was prepared and supplied by the Animal Research Station, Wallaceville.

REGISTRATION OF

DAIRY FACTORY MANAGERS

Intending applicants are hereby notified that applications for registration under the Dairy Factory Managers' Regulations should reach the Registrar, Dairy Factory Managers' Registration Board, C/o Department of Agriculture, P.O. Box 3004, Wellington, on or before 1st May, 1941. Forms are available from the Registrar.

Attention is drawn to the fact that under the Regulations, any application which is received by the Board after the 1st May, shall not, except in special circumstances, be considered by the Board until after 1st May, 1942.

H. G. PHILPOTT,
Registrar.

N.B.—This notice refers to parsons who are NOT AT PRESENT HOLDERS OF CERTIFICATES. Notice of renewal and renewal form will be posted to every registered manager by the Registrar.

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THE Director-General's PAGE

Dairy Production

IT is probably many years since seasonal conditions looked at from all angle were so favourable for dairy production over the Dominion as a whole. The dry spell which began in December continued during the first two weeks in January, and during this period the very heavy growth of grass which was induced by the favourable spring was made into hay and ensilage in quantities and of a quality which has seldom been exceeded. During the second half of January sufficient rain fell in most of the dairying districts to induce a satisfactory second growth of grass, and this has been repeated at intervals up to the date of writing with the exception of the North Otago-Canterbury area.

The quantity of dairy produce forwarded to the grading ports for export for the season still shows a substantial increase over last season for both butter and cheese, though the percentage of increase for the season to date has decreased as expected. Compared with last year, there has been a reduction in the quantity of butter received at most ports last month, and at one port there was a reduction in both butter and cheese.

In response to the call from Great Britain, further quantities of milk are being changed over to cheese-making for the balance of the season, and we have, at the moment, the unusual incident of a new cheese-making plant being installed in a factory to start operations as soon as the work is completed, while a number of inquiries have been received regarding licences for other buildings for next season.

Following the rains, a marked improvement in the quality of both butter and cheese, due to some extent to the cooler temperatures and also to the freshening of the pasture growth, has been noted, and the output at many factories has shown an appreciable increase.

Ragwort Plant in Super Bag

A FERTILISER company recently received the following letter from a Putaruru farmer:—

"I am forwarding you, under separate cover, a ragwort plant which my man found in a bag of your super when topdressing my ensilage paddock. It was lying in the shed for about ten days; consequently a lot of the seed has dropped off. I have no doubt that by carelessness of this description ragwort is being spread over the country. The paddock I topdressed was clear of weed, but I dread to think what it will be like after this."

In some districts farmers are in the habit of using superphosphate bags as a receptacle for ragwort plants which they have pulled, and this is not the first instance where bags which have not been properly emptied of plants have been sent to lime or fertiliser works for refilling.

A few years ago the occurrence was so frequent that managers of certain lime companies gave instructions that all manure bags were to be turned inside out before being filled at the works.

Now that fertiliser companies, in view of the shortage of bags, are buying back bags from farmers, it behoves all farmers to exercise the greatest care to see that the returned bags do not contain the seeds of any noxious weed.

Supplies of Copra

BECAUSE of a scarcity of our usual feed supplies and other circumstances it will be necessary during the coming year to use considerable quantities of copra as a winter feed for pigs. Copra is the entire dried kernel of the coconut, containing 65 to 75 per cent. of oil, 15 to 20 per cent. of carbohydrate, and 8 to 9 per cent. of protein. Its high oil-content made it too valuable a commodity for feeding stock in the past, and for that reason few farmers in New Zealand have had experience of it in this role.

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In countries where it is produced, however, it is regularly fed to pigs, and reports from these countries enable us to state with assurance that it is most satisfactory. Because of its high oil-content, copra has at least one and three-quarter times the feeding value of barley, and in view of this, at its present price, it is of equal value to barley at 2s 6d per bushel on trucks main ports.

An article on its feeding qualities and how to use it is published in this issue of the "Journal."

Supplies for winter use will be coming forward some time in March, and farmers are especially asked to get in touch with their merchants, in order to enable deliveries to be made to farms direct ex-ship. This is requested because of relatively high rates charged for storage of copra and the desirability of keeping the costs to farmers as low as possible.

Provided it is not exposed to the weather and is kept in a dry place, copra stores remarkably well. Samples held now for more than six months in New Zealand do not appear to have suffered any deterioration. It may not be wholly convenient to take delivery of and store your full season's requirements, but your action in doing so will be a very great help to Government Departments concerned in providing adequate supplies.

Government Stock Seeds

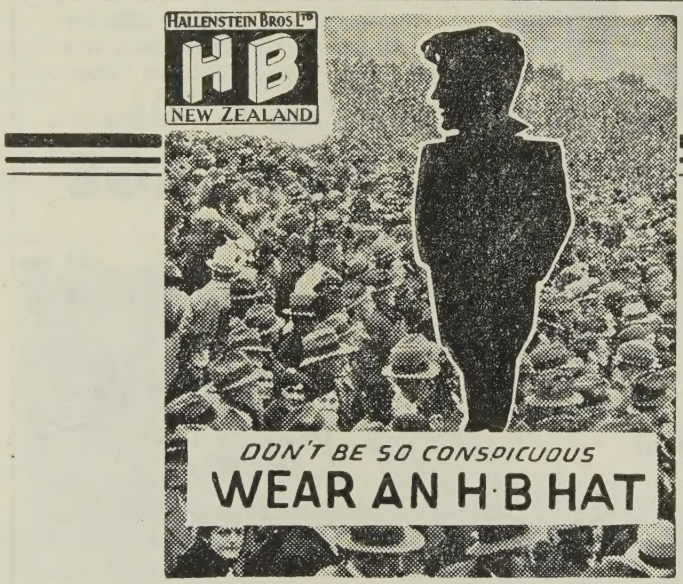
IT is very evident from the experience of last year in the distribution of certified Government Stock seeds that the method of allocation adopted in the past does not satisfactorily meet the position. This is due to the unprecedented demand which has arisen for these seeds, together with the fact that the supply, in practice, is limited to relatively small quantities.

It is considered unwise from the viewpoint both of actual seed production and of multiplication difficulties to increase to any great extent the quantities of certified Government Stock seeds produced. As the demand is beyond control, however, it becomes necessary to adopt a method of distribution which will result in the seed being used to the fullest advantage in rapidly increasing the quantities of seed available. The points which need to be considered in putting this aim into effect may be summarised briefly as follows:—(a) suitability of district; (b) suitability of individual area; (c) whether seed production from the area is to be the primary aim; (d) whether the acreage established on any one farm is such that frequent harvesting of the area becomes impossible.

Also, as past experience suggests that some farmers will be disappointed in the fulfilment of their orders, the allocations of seed are to be made at a date which will allow farmers to know, before finally preparing their land and committing themselves to the sowing of certified Government Stock seed, whether such seed will actually be available.

To this end, it is the intention of the Department that reservations of certified Government Stock seeds will be made in future on the conditions as set out below, and the Department will select those areas to be sown with the seed available for distribution.

(1) Merchants are asked to make reservations for certified Government Stock seeds, supplying the following information in each case:—(a) name and address of farmer; (b) acreage of individual paddock or paddocks for which seed is required; (c) quantity of seed required; (d) where reservations are asked on account of one farmer for more than one kind of seed, it must be stated whether it is proposed that such seeds are or are not to be sown together. (In normal circumstances reservations will be made for only one kind of seed for sowing a particular area. Merchants may still order seed on their own behalf, but must state in such cases the name and address of the farmer who will sow the seed.



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From Whangarei in the North to Invercargill in the South.

(2) Reservations made up to June 30 in each year will be considered together in allocating the seed available from the previous harvest. This seed will be allocated to fill those reservations which in the opinion of the Department will result in the best utilisation of the seed available. In filling any reservation sufficient seed will be supplied to sow the complete paddock affected.

(3) Notification of the filling of reservations, together with the particulars of the seed available, will be sent to the merchants concerned at September 1 or such later date as may be necessitated by delays occurring in threshing and harvesting.

(4) Merchants will be asked to confirm all accepted reservations within one month of the dispatch of advice that seed has been allotted, and seed will be made available on receipt of confirmation. Seed held for orders not confirmed by the specified date may be re-allocated.

(5) The seed supplied must be sown on the area to which it has been allotted, and in agreement with the local Instructor in Agriculture in regard to the method of sowing, manuring, and subsequent treatment in an endeavour to obtain the greatest return for the seed sown. Should it not be possible or desirable to sow the seed on the area originally intended it may, in agreement with the local Instructor in Agriculture, be sown on any other area on the same farm. Only on special application and in exceptional conditions will transfer of seed from one owner to another be considered. Failure to observe the conditions of this clause may result in non-recognition for certification of the area sown.

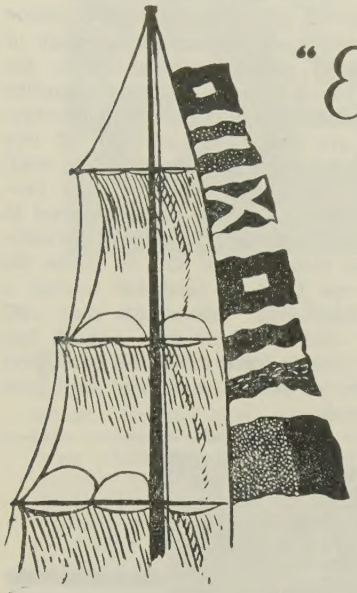
The Department of Agriculture expects to have for distribution in 1941 quantities of the following certified Government Stock seeds:—Perennial ryegrass, Italian ryegrass, white clover, Montgomery red clover. (Note: Cocksfoot is distributed by Canterbury Agricultural College.)

Fruit Inspection

THE staff of the Horticulture Division has been depleted by the calls for military service, and with the advent of the fruit-harvesting season it has become necessary to appoint new officers to fill the vacancies which have occurred on the fruit inspection staff, particularly in view of the Government's decision to help the fruit industry by again purchasing the crop of apples and pears, which is inspected, graded, and packed to standards before being purchased by the Internal Marketing Division.

In general, the fruit crop reports indicate that the apple and pear crop to be handled under this arrangement will be slightly smaller than last year.

As officers engaged on this class of work are required to have some skill above the ordinary, it is not an easy matter to find the right type of men for inspection work.



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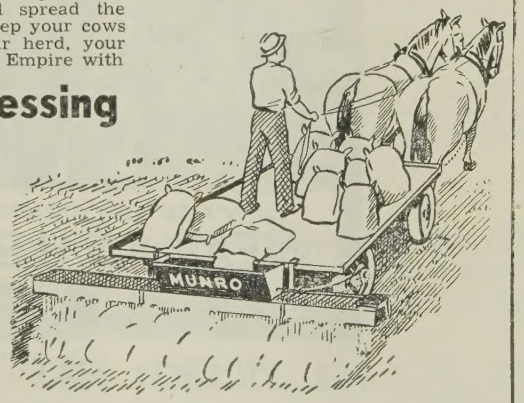

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SEED MIXTURES FOR PERMANENT PASTURES

By
A. M. LEE,
Fields Instructor, Kaitaia.

When making up seed mixtures for permanent pastures there are four cardinal points to be considered: (1) Suitability of species to soil fertility; (2) competition between species; (3) importance of strain; and (4) establishment capacity of seed germination.

There Are Four Cardinal Points Which Must Be Observed

ON several occasions recently the writer has been asked to advise on the selection of grass seed mixtures for development schemes and on some few farms. In all cases consideration of the four points above has been the basis of any recommendations. There are several factors which influence the establishment of permanent pastures.

Cultivation

Unless a suitable seed-bed is prepared, establishment will be poor or certain species may establish first and grow rapidly, thus competing unfavourably with seedlings germinating subsequently. Cultivation may be so poorly carried as to induce poor drainage, which will result in a sward low in vigour and invaded by weeds and rushes.

Management

In the initial stages, incorrect handling of young grass, either under or over stocking, will adversely affect the establishment and involve the loss of good seed and manure.

Topdressing

The manurial programme calls for careful attention. Generally speaking, a dressing with the seed is recommended, followed by a further light dressing two to three months after the sward is established. In no circumstances should a nitrogenous fertiliser be applied with the seed mixture, and only rarely on a young sward.

A case recently came under the writer's attention where new grass was sown down with a dressing of blood and bone. A good flush of growth was obtained during the first six months, but the ryegrass and clovers later turned yellowish and finally died out in patches during dry weather. As the pasture was unduly forced, poor root development resulted, so that the species could not survive the dry spell. Perhaps this is rather an extreme example, but it serves to illustrate the evils attending incorrect manuring.

There are four cardinal points governing the selection of seed mixtures.

(1) Suitability of Species To Soil Fertility

Research workers have shown that different species thrive on different levels of fertility; local conditions also affect the vigour of pasture plants on various soil types. Man has so interfered with the cycle of plant associations planned by a provident Nature that he now has to build up the fertility of soils to a level which will carry pastures for the feeding of his stock. These built-up soils have come to be known as grassland soils.

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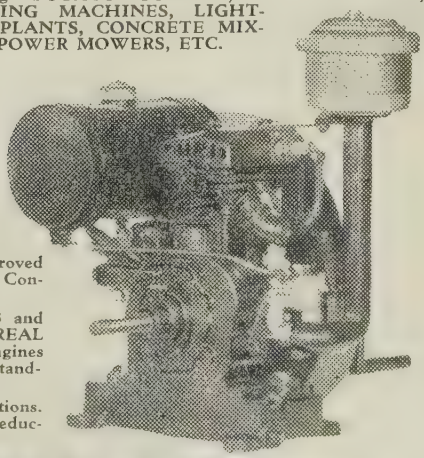

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In the case of deteriorated hill country it has been found that perennial ryegrass will not hold, and its place is taken by weeds or fern. A mixture suited to unploughable country of this nature has as its main constituents:—

Cocksfoot
Browntop or danthonia
Crested dogstail
Paspalum (Auckland Province)
Lotus species and subterranean clover
Yorkshire fog
Perennial ryegrass is sown, but is often temporary.

On the ploughable hill country white clover and perennial ryegrass can be introduced on the more fertile clays, such as limestone. In cases where topdressing can be carried out economically on poor hill country and subdivision is adequate, the level of fertility can be raised to enable a rye-clover-paspalum sward to be established.

Browntop is suited to the damper and more shady faces, and this environment also meets the requirements of cocksfoot. On the more exposed, sunnier situations danthonia establishes and thrives better than browntop. Of the clovers, subterranean, *Lotus major* and *Lotus hispidus* occupy a lower plane or fertility to that of white and red clover. On the very poor silica soils *Lotus hispidus* establishes freely, and is a good fertility builder where these types occur.

The meadow grasses—timothy and meadow foxtail—should be sown on the heavy fertile clays and semi-alluvial flats.

(2) Competition Between Species

Selection of mixtures must aim at producing that desirable "balance" in the pasture. This balance, however, must be maintained by proper management, stocking, and topdressing. Perhaps the most notable example of one species crowding out other and more permanent species is the inclusion of too great a quantity of red clover mixtures, and the same applies to Italian ryegrass. These two pasture plants are quick growing and purely temporary elements in the sward, so that if they make up too great a proportion of the young sward the permanent elements—ryegrass and white clover—will suffer, to the detriment of the permanent pasture. Therefore, only sufficient of the temporary species are included to act as fillers until the long-lived species are established.

Here is an example of a mixture for pasture on ploughable limestone hill country:—

Perennial ryegrass	25lb	20lb
Italian ryegrass	8lb NOT	15lb
Cocksfoot	8lb	8lb
White clover	2lb	2lb
Red clover	1lb	3lb
Total	44lb	48lb

(3) Importance Of Strain

Too much emphasis cannot be laid on this aspect of pasture establishment. Just as animals adapt themselves to local conditions or become acclimatised, so do plants build up different forms or strains for characteristics, such as permanence, leafiness, seed-producing qualities, and so on. In New Zealand different strains of ryegrass and clovers have been selected from plants which exhibited the desirable forms of permanence and leafiness for pasture production. Seed from these plants has been bulked for regrowing and the further production of seed for distribution to farmers. It has been found that these lines of certified seed fully repay the grower for the establishment of permanent pastures.

(4) Establishment Capacity

The establishment capacity of a seed mixture means the number of plants which survive from the number of seeds which germinate. One of the aims of the plant breeder is to produce strains which have a high establishment capacity; thus, the farmer may rest assured that he will receive full value for his money if he sows certified seed, always provided, of course, that the species sown is suited to the level of soil fertility. If, for example, perennial ryegrass is sown on poor, leached soils, germination may be high, but subsequent establishment will be low. On the other hand, if a mixture containing, say, Yorkshire fog, browntop, and *Lotus hispidus* is broadcast on these low fertility soils better results will be achieved and a "grassland soil" built up, which may ultimately reach a level where ryegrass and white clover can be sown to form a permanent pasture.

Hard-and-fast rules cannot be laid down for the selection of pasture seed mixtures for any soil type, but the above remarks are given as a guide, and if the four cardinal points mentioned are observed successful permanent pasture establishment will result.

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Concrete on the Farm

Full Description Of How To Use Concrete For Posts and Troughs

By J. A. S. MILLER,
Instructor in Agriculture,
Wellington.

Having dealt in the previous article with mixing concrete and the construction of floors and paths, the author concludes by discussing the manufacture of concrete fence posts, water troughs and buildings.

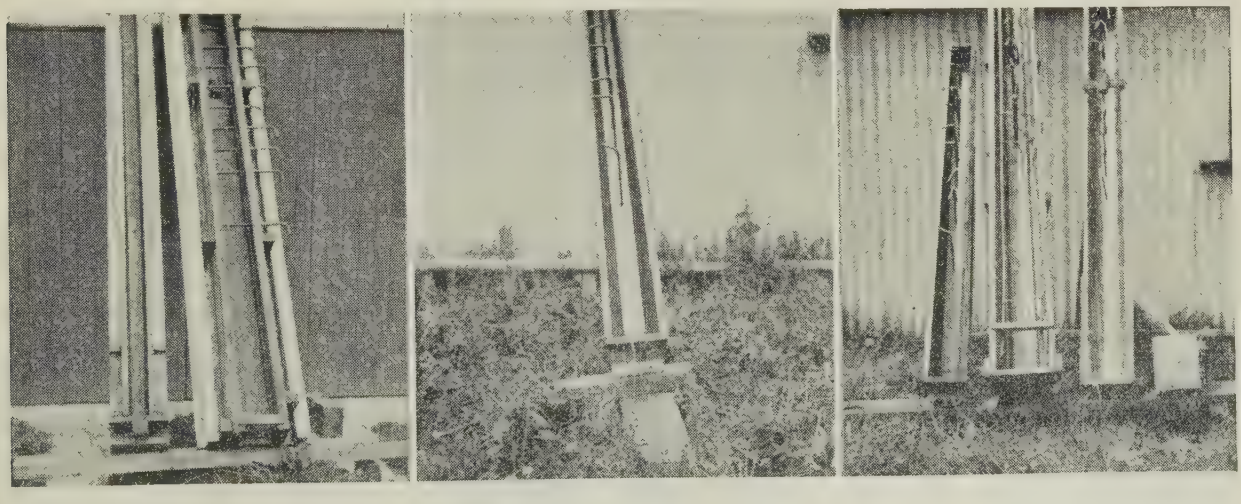
A close-up of concrete fence posts, showing the method of fastening the wires to the strainer by threading them through the holes provided for the purpose.

Fencing Posts

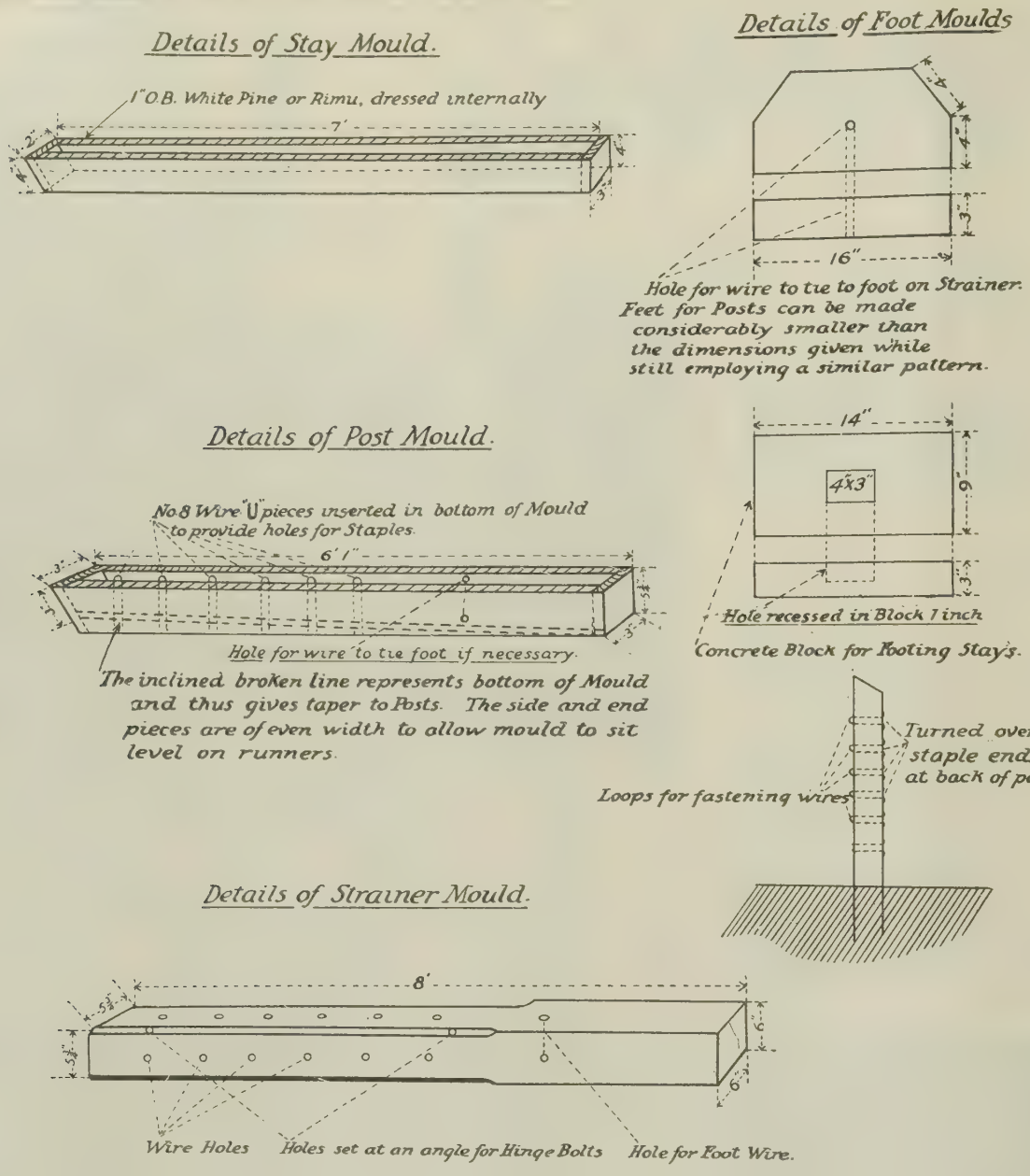
Concrete posts are rapidly gaining in popularity for obvious reasons. They are durable, neat in appearance, and relatively cheap. Their resistance to fire is a very useful characteristic.

There are numerous shapes and sizes of concrete posts, but for general duty intermediate posts, dimensions of 6 ft. x 4 in. x 4 in. are eminently suitable, but no matter what particular style of post is chosen **adequate reinforcing is essential. It is not merely a matter of bundling into the mould several pieces of old iron and imagining that this is all that is required. Reinforcing rods near the centre of the post are quite useless.** Actually, the nearer the exterior of the post the better, provided the rods are not exposed and thus allowed to rust. In general practice, a depth of ½ in. from the outside of the post is the most suitable.

It is generally desirable to prepare intermediate posts in a gang mould—one capable of turning out six or more posts at a time. Apart from saving time, it enables the most efficient use to be made of one mix of concrete. For example, a one bag mix will make six 6 ft. x 4 in. x 4 in. posts.



From left to right: The mould for the ordinary post, the mould for the large strainer post, and the mould for the small strainer post.


Details of Stay Mould.
1" O.B. White Pine or Rimu, dressed internally
7'
Details of Foot Moulds
16"
Hole for wire to tie to foot on Strainer.
Feet for Posts can be made considerably smaller than the dimensions given while still employing a similar pattern.
Details of Post Mould.
No.8 Wire "U" pieces inserted in bottom of Mould to provide holes for Staples.
6'1"
Hole for wire to tie foot if necessary.
The inclined broken line represents bottom of Mould and thus gives taper to Posts. The side and end pieces are of even width to allow mould to sit level on runners.
14"
4"x3"
Hole recessed in Block 1 inch
Concrete Block for Footing Stay's.
Turned over staple ends at back of post.
Loops for fastening wires
Details of Strainer Mould.
8'
Wire Holes
Holes set at an angle for Hinge Bolts
Hole for Foot Wire.

All Dimensions given are internal.
The Bevelleled Edge to the Strainer is not absolutely necessary but it adds to appearance and tends to reduce the tendency of cutting into wires that a sharp cornered strainer would have.

The construction of a suitable mould should present no great difficulty, but for the sake of efficiency it should be made as durable as possible. Only well-seasoned, dressed Oregon should be used, and the minimum thickness of the timber should be 1 in.

Good Baseboard Essential

A good solid baseboard is essential, and on this are constructed the necessary cleats and blocks which support the mould sides. Care must be taken to prevent the side members from bulging when the concrete is being introduced, and to do this blocks should be fitted on extreme outsides of each of the outer members, while the inner boards are held in place by a transverse slotted board, which fits over them.

In placing the concrete, fill one mould at a time. First spread about ½ in. of concrete evenly over the bottom and place the reinforcing rods (which should be 2 in. shorter than the post) ¾ in. from the inside edges of the mould, pushing them into the concrete to a depth of ¼ in; for 4 in. x 4 in. posts, ¼ in. steel rods are used. Fill up until ½ in. from the top of the mould, and

place the other rods, sinking them to a depth of ¼ in., ½ in. from the edges.. Complete the filling, allowing some extra (1-8 in.) on top to account for the shrinkage. After half an hour beat the surface of the concrete with a piece of wood having an edge of one inch. The material will then resemble a jelly, and it will be noticed that the surplus water and scum has oozed to the surface. This should be scraped off to the level of the mould sides. When the concrete is about eight hours old, cover with damp bags and leave until it is decided to remove the posts from the moulds—a matter of two or three days, depending on whether the conditions are warm or cool. The posts thus removed should still be covered with damp bags for four or five days more.

It should be noted that it makes no difference to the initial set whether normal or rapid-hardening cement is used. It is in the final stages that rapid hardening cement indicates its usefulness. Using this, cement posts may be put into commission after 10 to 15 days old, depending on the weather. Ordinary cement requires 28 to 38 days. To reduce the time required in the moulds, calcium chloride may be used as an accelerant.

After the posts have been removed from the moulds the mould should be well washed and, when dry, treated with a thin mineral oil, such as crankcase drainings. This treatment should also be applied before the moulds have actually been used.

Attaching Wires

Wires may be attached to the posts in a variety of ways.

(a) By running the wires through holes in the post.

(b) By means of half staples which can be bent over the wires when the latter are in position.

(c) By double staples, placed parallel with the wires (that is, one above and one below) with a length of wire running through the eyes of the staples and thus holding the fence wires in position.

(d) By using an improvised staple, which consists of a length of No. 8 gauge wire which is bent so that one leg is about 2 in. long and the other about 5 in. This grips the wire and is driven through the post in 3-8 in. holes running at right angles to the line of the fence wires. The longer leg of the staple is then bent down at the back of the post, sometimes into a groove specially moulded into the post. This is fast becoming the most popular type of wire fastener for use with concrete posts.

Mixture for Posts

The concrete mixture required for ordinary fence posts consists of gravel having a maximum diameter of 3-8 in. A one-bag mix should be used, and the aggregate should be in the proportion of 3 cubic feet of 3-8 in. graded gravel measured loose to 2 cubic feet of loosely measured sand. If the sand and gravel are already mixed in suitable proportions, only 3¾ cubic feet of this aggregate need be used. If sand alone is used, take 5 cubic feet. The mixing water should not exceed 7 gallons for this mix.

For corner posts and straining posts, only single moulds will be required, as relatively few of these are needed in proportion to the number of intermediate posts. Corner posts need not have dimensions greater than 6 ft. 6 in. x 6 in. x 6 in., while straining posts for straight fence lines can be built to a size 6 ft. 6 in. x 6 in. x 4 in., and the moulds can be made accordingly.

With the above types of posts, struts are generally necessary, and these may be made from concrete to a size of

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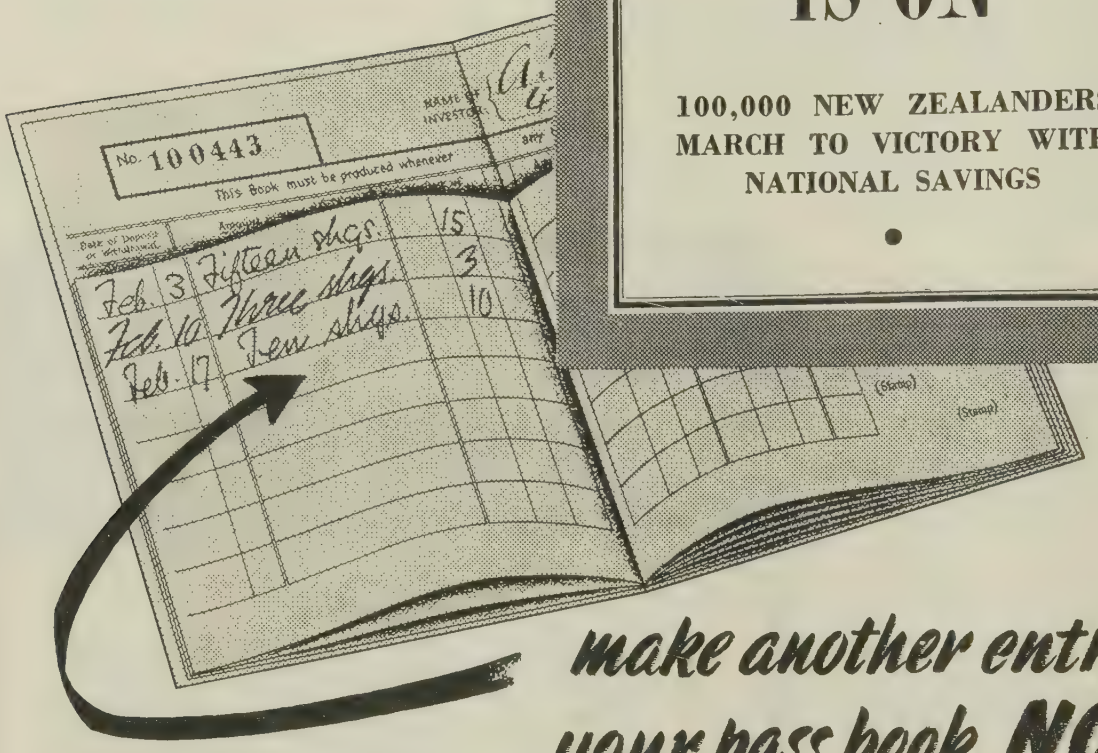

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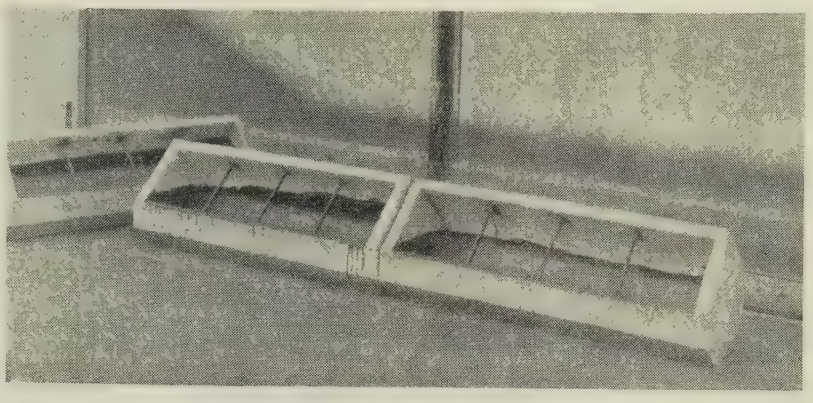
7 ft. x 4 in. x 3 in. To receive the upper end of the struts a slot should be moulded into the post by using a triangular block of wood at the bottom of the mould and in the required position. The lower end of the strut should be supported on a foot constructed from concrete 1 ft. x 6 in. x 3 in. thick. Reinforcing should consist of 5-8 in. steel in the case of corner posts, 7-16 in. for strainers, and ¼ in. for struts.

The following table is useful in making the above posts:—

Class of Post.	Dimensions.	Reinforcing.	Approximate weight of finished post.	Number of posts to each bag of cement
Intermediate posts	6ft. x 4in. x 4in.	¼ in. steel	95 lb.	6
Corner posts ..	6ft. 6in. x 6in. x 6in.	⅜ in. steel	245 lb.	2 2/3
Straining posts on straight ..	6ft. 6in. x 6in. x 4in.	7/16 in. steel	160 lb.	4
Struts	7ft. x 4in. x 3in.	¼ in. steel	85 lb.	7



Concrete feed troughs are both clean and efficient.

Water Troughs

Concrete as a material for water troughs cannot be excelled for the reason that it is most durable, absolutely waterproof if properly constructed, and requires no maintenance.

The troughs to be constructed on a farm will vary according to the type of stock carried and the purpose for which they are required. Horse troughs are usually of rectangular design and of robust construction, but perhaps the most useful type for general utility is one constructed in a circular form. The building of such a trough can be repeated any number of times, as the moulds are generally made from corrugated iron specially curved to suit the dimensions of the mould.

The following data covers the materials necessary for the construction of a trough capable of supplying 100 cows or 500 sheep, even with a slow feed pipe.

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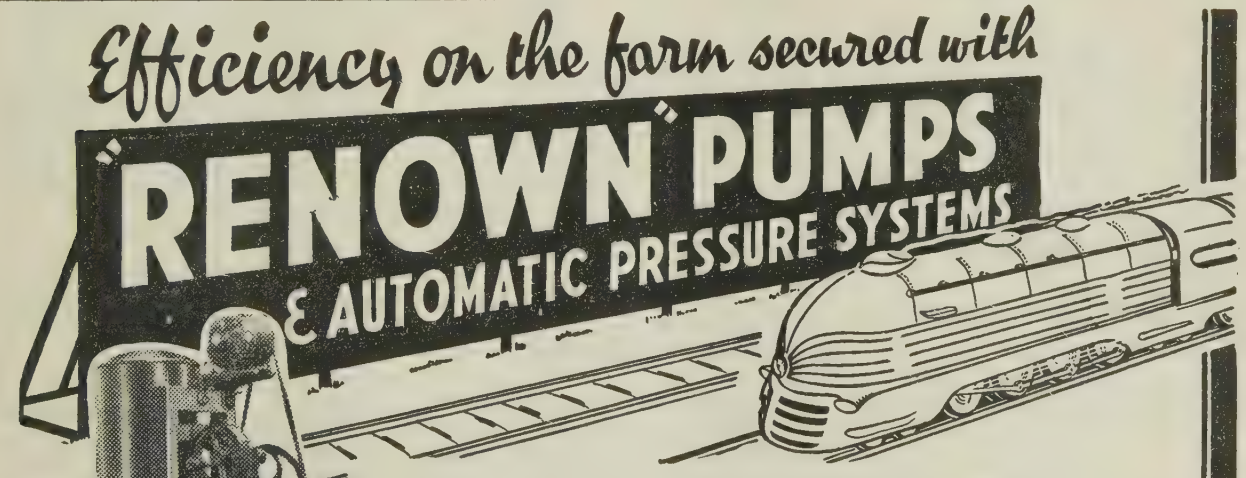

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For the inner mould two 9 ft. sheets of corrugated iron are required, and these should be rolled to give a clear inside diameter of 5 ft. 2 in., while for the outside, two 10 ft. sheets rolled to give a diameter of 5 ft. 10½ in. are necessary. These lengths will provide an overlap of sufficient length to allow for joining. The sheets should not be more than 21 in. high.

The components of the mould are bolted together with stove bolts at the overlap, allowing sufficient bolts to give the necessary rigidity. For convenience, wooden handles should also be fitted near the joints to allow easy removal of the moulds. These handles are merely pieces of wood 2 in. x 1 in fixed vertically.

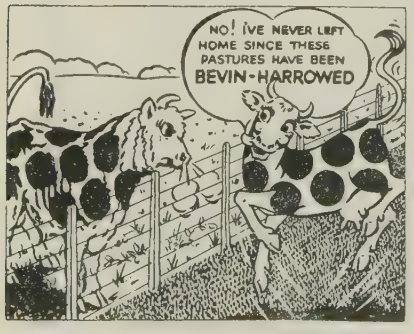
To construct the trough, lay the floor and allow it to set. Strips of tarred felt or old sacking are laid round the base of the walls and the mould set up. The inner mould is first placed and then wrapped round with heavy gauge wire netting, using a few vertical strips of wood 1¾ in. thick to space the netting away from the mould. As soon as the outside mould is set up the concrete can be poured in, the spacers being removed as the mould fills.

Careful tamping is essential to ensure a waterproof job. The moulds may be removed after three days with rapid hardening cement, and after seven days with ordinary cement.

A ball and chain valve should be used to control the water feed, the pipe of which is either set into the floor or taken up over the wall of the trough and down the bottom by means of suitable fittings.

The materials required are as follows:—

Cement, 5 bags.
Sand, 11 cubic feet.
Gravel, 20 cubic feet (1-8 in.-3-8 in.).



A concrete water trough constructed from an old corrugated iron tank which was used as a mould.

With each bag of cement, mix 14 gallons of sand and 25 gallons of gravel, using only 6 gallons of mixing water. However, most men have their own ideas about constructing a trough. The main points to be considered are suitable concrete mixtures and careful reinforcing.

Large Troughs

Large square troughs can be constructed for use in watering four paddocks simultaneously. Such troughs should have internal dimensions of at least 8 ft. x 8 ft., and should be 2 ft. deep.

The foundation should be carefully prepared, as the weight of the trough will be considerable. To ensure rigidity, it is desirable to reinforce the whole structure, floor and sides. This is best carried out by using prepared expanded metal or by means of 3-8 in. steel rods. Whatever method is adopted, the chief consideration is that of carrying the reinforcing from the floor right up the sides.

The floor is first filled in with high-grade concrete to a depth of 3 in. to 5 in., and the side forms (which have been constructed previously) erected. These forms should be well built from *Pinus radiata* or other suitable timber, and the sides well braced to prevent bulging while the concrete is being introduced. It is desirable to do all the concrete work at the one time, as it is difficult to bind new concrete with old.

In from 12 to 14 hours, depending on weather conditions, the forms may be removed and the sides of the trough rubbed with a wooden float to obtain a smooth surface. Plastering is unnecessary if a good concrete mix has been used. In any case, it is essential to prevent the concrete from drying out too quickly, and to this end the sides should be covered with wet bags and some water allowed to remain on the floor.

During the construction of the floor the water inlet pipe should have been introduced somewhere near the centre, and, where practicable, a 3 in. to 4 in. glazed earthenware bend should be provided to allow flushing. The inlet pipe, ¾ in. to 1 in. diameter, depending on the pressure of the water supply,

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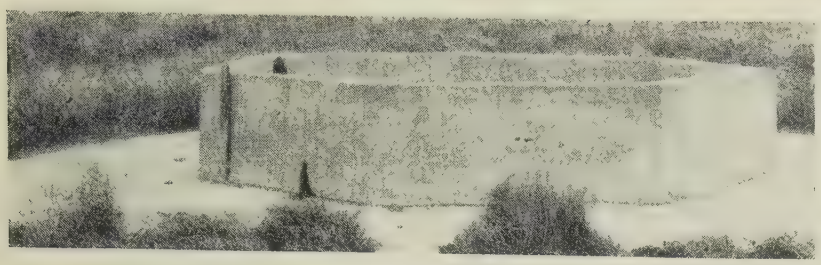

A seven-sided watering trough constructed of concrete.

should protrude about 6in. from the floor of the trough and have an elbow screwed to it. The ball cock with ball removed is then connected and a suitable length of chain to the ball, which is then able to float on the surface of the water without fear of damage to the valve below. A rubber-lined wooden plug, suitably weighted and fitted with a handle, should be inserted over the drain bend, and this can be removed from time to time to clear away any sediment.

Pig Troughs

A suitable pig feeding trough is comparatively simple to construct and is useful for all feeds except skimmilk, the acids from which are liable to attack concrete. Suitable reinforcing is also required, as in the case of other troughs.

A useful trough for watering pigs has an inside measurement of 3ft. x 2 ft. x 9 in. deep. The trough is divided into two sections by an inverted concrete box 2 ft. x 1 ft. x 9 in. deep which houses the ball cock and thus prevents any damage to it. The sides of this inverted box are slotted to allow a free flow of water. The concrete is sufficiently reinforced throughout, and is about 2 in. thick.

Concrete Drains

The use of concrete for gutters is well recognised, and concrete pipes for drainage purposes are very widely used, especially where pipes of larger diameter are required.

Concrete pipes for farm sewerage purposes can be prepared and laid in the following manner. A cylindrical form is prepared, the diameter of which is that of the inside of the pipe required. This form is constructed from heavy gauge sheet iron, and is split from one end to the other by a long tapering cut. When the form is in use this cut is filled by means of a long slide shaped to the same taper, so that when it is inserted the form has an even diameter throughout.

The trench is dug as for laying ordinary drain pipes, and about 2 in. of concrete placed on the bottom. With the slide inserted, the form is laid above the layer of concrete. More concrete is then poured on top of the form, adequate ramming going on during this time until there is a layer of about 2 in. of concrete right around the form. This is allowed to set for about two hours, after which the slide of the form is pulled out about 3 in. to allow the easier removal of the mould. After from six to twelve hours the slide is withdrawn completely so that the walls of the form collapse. A 2 in. layer of concrete is placed in the trench as before, and the form can now be pulled out until only about 3 in. of it remain inside the completed section. The slide is replaced and the concrete poured on until the next section is completed.

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Pipes of any diameter can thus be made, although the construction of the form may present some difficulty. About 24 feet a day can normally be laid, the form being about 8 ft. long.

No reinforcing is required unless there is to be heavy traffic over the drain, in which case the concrete must also be made thicker. The trench can be filled in immediately after the removal of the mould, and this has the advantage of preventing too rapid drying out of the concrete. Junctions and changes in direction are made by means of a concrete box into which the pipes run. These boxes are covered by a concrete lid, which can be removed to clean out the drain in case of blockage.

Concrete Buildings

Concrete buildings are constructed on two main principles, namely, concrete laid on the spot and concrete made into and used as "bricks." Of the two, the former is more often used in the construction of out-buildings, while the latter is used in the construction of dwellings, the reason being that the "bricks" are usually made with a hollow section and thus allow for ventilation and provide a double wall.

In the construction of walls of solid section, the general practice is to erect piers of considerable strength and then fill the 6 ft. intervals between them with a "curtain" wall. Depending on the height of the walls, the piers may be 6 in. x 6 in. or 8 in. x 8 in. in cross section. These are spaced at 6 ft. intervals, being inserted into the ground to a sufficient depth to ensure rigidity. The reinforcing of the rest of the wall is then bonded into them, a longitudinal slot running down each side for the full length of the wall to allow of bonding of the "curtain" walls. Rigid forms are then applied to give a normal wall thickness of 3 in. and the concrete poured in. The resulting wall is usually flush on the inside of the piers, while the outside presents a series of projecting ridges.

If the concrete is well prepared, plastering of the finished walls is unnecessary, the concrete being well rubbed while in the "green" state.

Where concrete "beams" have to be constructed, as above doors and windows, great care must be taken in the prepartion of the reinforcing. As stated in an earlier part of the article, pure concrete cannot withstand bending, although it can resist considerable compression. A beam supported at each end is subjected to two distinct stresses —tension on the lower side, and compression on the upper. Thus, the reinforcing must be concentrated at the lower side of the beam where the tension occurs. Less reinforcing is needed on the upper side, where the stress is that of compression. For example, a 20 ft. concrete beam to carry a distributed load of 14 tons should be 15½ in. deep and 8 in. thick while the reinforcing should consist of two 3-8 in. steel rods at the top and four ½ in. rods at the bottom.

Suppose, however, that the beam is supported at intervals along its length on piles. Then, at each point of support the beam is bent in the opposite direction, that is, compression occurs on the lower side, while tension occurs on the upper. Hence, at this point, the reinforcing should be concentrated on the upper side of the beam.

If concrete columns are built, say, to support a floor, the reinforcing must be so arranged as to prevent lateral distortion of the column. An unreinforced concrete pillar supporting a heavy load would have a tendency to become barrel shaped. To overcome this tendency, wire stirrups are used to bind the reinforcing rods. For example, a column shorter than 8 ft. 10 in. x 10 in. reinforced by four ¾ in. rods would have stirrups of No. 8 gauge wire 8 in. apart along the length of the column. Such a column would support a load of 14 tons.

Acknowledgment

The author wishes to acknowledge the assistance given by Mr. J. R. Marks, A.M.Inst.C.E., M.N.Z.Soc.C.E., of Wilsons (N.Z.) Portland Cement Ltd., Auckland, in compiling this article.

Pig-keeping Broadcasts

A SERIES of broadcasts on pig-keeping has been arranged for delivery under the auspices of District Pig Councils. Addresses scheduled for March and April are as follows:—

Thursday, March 20, 7.15 p.m.: Station 1YA, Auckland—"Housing, Lay-out, and Sanitation."

Thursday, March 20, 7.15 p.m.: Station 3YA, Christchurch—"Producing Pigs Without Dairy By-Products."

Thursday, April 10, 7.30 p.m.: Station 2YH, Napier—"The Provision of Suitable Protein for Pigs."

Monday, April 14, 7.15 p.m.: Station 4YA, Dunedin, and 4YZ, Invercargill—"Pure Breeding of Pigs and Its Relation to Type and Carcase Quality."

Thursday, April 17, 7.15 p.m.: Station 1YA, Auckland—"The Wintering of Pigs."

Monday, April 21, 8.30 p.m.: Station 2ZA, Palmerston North—"Housing and Layout of Pigs."

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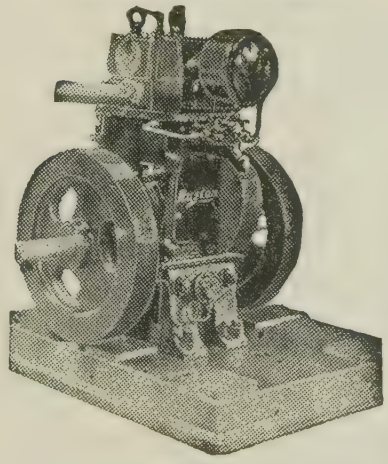

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FEILDING.

Half-yearly Fertiliser Returns — 1941

THE following returns from July to December, 1940, have been compiled by the Fields Division of the Department of Agriculture from figures furnished by courtesy of the Comptroller of Customs.

Fertiliser.	Origin.	July Tons.	August Tons.	Sept. Tons.	Quarter Tons.	Oct. Tons.	Nov. Tons.	Dec. Tons.	Quarter Tons.	Half-yearly Returns Tons.
Phosphatic fertilisers—										
Rock	Gilbert & Ellice Island	5,286	7,944	3,156	16,386	12,618	4,611	1,796	19,025	35,411
	Nauru	45,966	28,281	..	74,247	32,916	24,543	12,414	69,873	144,120
Total		..	..	..	..	..	..	..	..	*179,531
Guano	Seychelles	..	..	..	..	..	..	4,400	4,400	4,400
Other Phosphates	Belgium	10	..	..	10	..	..	..	..	10
	U.S.A.	..	..	..	..	..	..	20	20	20
Total		..	..	..	..	..	..	..	..	30
Total Phosphatic Fertilisers		..	..	..	..	..	..	..	..	183,961
Potash—										
Muriate	Palestine	..	..	..	..	..	..	30	30	30
	U.S.A.	..	..	..	..	..	937	..	937	937
Total		..	..	..	..	..	..	..	..	967
Sulphate	U.S.A.	..	..	72	72	..	..	..	..	72
	Australia	..	84	16	100	..	..	..	..	100
Total		..	..	..	..	..	..	..	..	172
Other Potash	Spain	..	..	..	..	..	20	..	20	20
	U.K.	1	2	14	17	..	..	..	..	17
	France	370	2	..	372	..	..	..	..	372
	India	..	..	20	20	..	2	..	2	22
	U.S.A.	..	..	..	..	..	1	1	2	2
Total		..	..	..	..	..	..	..	..	433
Total Potash		..	..	..	..	..	..	..	..	1,572
Nitrogenous fertilisers—										
Sulphate of ammonia	U.K.	50	..	..	50	..	..	..	..	50
	Canada	..	300	..	300	..	415	..	415	715
	U.S.A.	..	..	..	..	..	..	50	50	50
Total		..	..	..	..	..	..	..	..	815
Nitrate of Soda	Chile	..	..	..	..	650	300	99	1,049	1,049
	U.S.A.	..	..	..	..	..	3	..	3	3
Total		..	..	..	..	..	..	..	..	1,052
Total Nitrogenous Fertilisers		..	..	..	..	..	..	..	..	1,867
Other Manures	U.K.	12	47	6	65	..	..	..	..	65
	Australia	6	9	..	15	5	6	8	19	34
	U.S.A.	..	157	16	173	..	32	..	32	205
Total		..	..	..	..	..	..	..	..	304
Totals		51,701	36,826	3,300	91,827	46,189	30,870	18,818	95,877	187,704

* This quantity is equivalent to approximately 287,249 tons of superphosphate.

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COPRA AS A PIG FEED

Supplies Now Available To Farmers

By the LIVESTOCK DIVISION

THERE is every likelihood that copra will form a large part of the winter pig-meal supply for the coming season, and as its feed properties are practically unknown to farmers these notes are supplied for their information. The subject matter has been collected chiefly from reports of copra fed in other countries, combined with the results of feeding trials conducted in New Zealand since supplies of copra have been available.

Considerable numbers of pigs are fed on copra or copra meal throughout the Western States of America, in Europe, and in the Pacific Islands, where the copra is produced. All reports agree that pigs grow surprisingly well on copra, and this is in agreement with the feeding value of the stuff.

Pigs get sleek and lively, more so on copra than on any other meal so far used, but they can also be easily sickened by any excess of copra fed, and while some feeders can get pigs to eat as much as 2 lb. daily the usual recommendation is that the ration should be limited to one pound daily for pigs over 100 lb. live weight, and to half a pound for lighter pigs.

Whereas most pigs take to copra immediately, especially the older ones, some feeders report that it takes from a few days to a fortnight to get younger pigs on to the feed. Difficulties of this kind could be overcome by introducing copra in very small amounts long before it was necessary to use it, say, at the litter stage. Little difficulty should then be experienced in getting pigs to take their full amount when copra becomes their chief meal ration.

It can be fed directly from the bag, or it can be soaked in water, when it swells and softens. There is apparently no advantage obtained by soaking it. It is too oily to crush satisfactorily. Where no milk is available half a pound of meat meal should be fed daily per pig, with copra to make up for its deficiency of protein.

Influence on Carcass Quality

While there is a general fear that copra will taint bacon and give the fat a tendency to rancidity, the properties of coconut oil are such that on fundamental grounds one would not expect these things to happen. So far there are only a couple or reports on cured bacon and both are satisfactory. The fat is white, harder than usual, and free from any taint. This is very encouraging and if confirmed by subsequent tests will be of very considerable value.

However, in view of complaints received in past years about bacon spoilage from another source of feed it is strongly recommended for the present that copra be used to feed young and growing pigs, and, except where trials are being carried out, that it should not be fed to pigs during six weeks to a month prior to slaughter. At a later date it may be possible to withdraw this caution, but there is no object in taking any unnecessary risks about spoiling our bacon quality at the moment. Feed it to young and growing pigs and so release a sufficiency of other grain meals to feed the finishing pigs.

Composition

Copra is the meat of the coconut and is supplied in pieces the shape and size of a heavy tea cup or chips therefrom. The nut is broken, the meat removed, dried in a kiln or in the sun, and shipped in bags. Kiln-dried copra with a lower moisture content keeps better than the sun dried, but both kinds store readily for a year or more.

It contains between 60 and 70 per cent. of oil; 5 to 7 per cent. protein; 12 to 15 per cent. ash, fibre, and carbohydrate, and 6 to 10 per cent. of moisture. This gives it a feeding value at least equal to 1¾ times that of barley, pound for pound, and makes it a remarkably cheap feeding stuff.

Getting Supplies

The high oil content makes it unsuitable to store in large quantities, although it stores satisfactorily in small quantities or when not tightly packed. For this reason farmers are asked to take their season's supply direct from ship's side. This saves handling into and out of store and has everything to recommend it. Farmers will be advised when cargoes are available.

All should make themselves as familiar as possible with copra during the next few weeks by discussing it with their neighbours, and farmers are particularly asked to place orders with merchants for delivery on arrival of the amounts they will require for winter use. From one half to one hundredweight per pig should provide all the meal required during the winter months.

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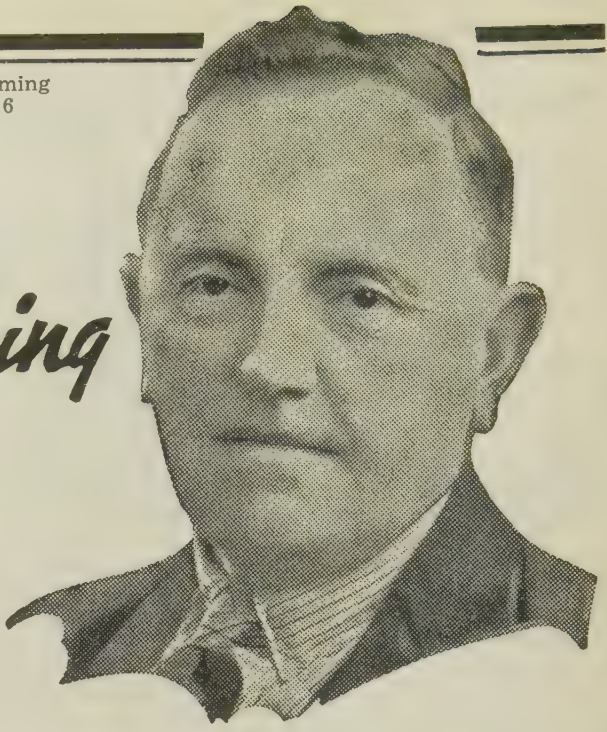

Mr. W. J. HILLIS, Seaward Downs, Southland, speaks with the authority of much experimentation and long experience. In emphasising the need for correct drenching, he refers with high appreciation to the merits of the Premier "BIG 3" Drenches.

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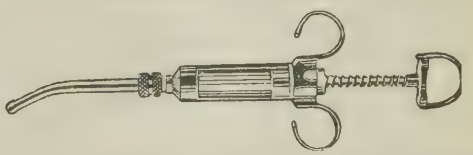

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"STAGGERS" IN ANIMALS

★ *Some confusion seems to exist as to the type of "staggers" from which an animal may be suffering. This article clarifies as far as possible the significance of inco-ordination of movement, which may be termed "staggers" or "staggering."*

— By —
J. MULLINS,
Veterinarian, Hamilton.

STAGGERS or staggering is due to the inability of the affected animal to co-ordinate or control properly its movements, and is associated with many affections at some stage or to some degree. This inability is usually due to a disturbance of the nervous system—brain, spinal cord, and nerves—brought about by various causes, each actual cause setting up its own train of symptoms, of which staggering, characteristic or otherwise, is a marked symptom.

Ryegrass Staggers

Ryegrass staggers is occasionally encountered in sheep, cattle, and horses during the autumn months. It is more usually found on predominantly rye pastures; hence the name "ryegrass staggers." The actual cause of this di case is unknown. Affected sheep will feed quite normally, and unless closely observed, nothing unusual may be noticed as long as they are left undisturbed. If disturbed or frightened (as by putting a dog on to them) a number may be seen to develop quickly a peculiar action and to drag the hind legs on the ground and fall. This condition may continue for some time, but complete recovery is the rule.

Beyond a change of feed, if possible, and leaving undisturbed, no treatment is necessary or advised. Cattle and horses may be similarly affected.

Paspalum Staggers

Paspalum staggers is due to the ingestion of ergotised paspalum seed heads, and as paspalum is a late seeding grass, the trouble will be encountered in the autumn. This grass may be badly affected with ergot in some seasons, causing at least an amount of trouble and inconvenience among cattle. Sheep and horses are less likely to be affected because of their grazing habits.

The toxin or poison evolved from these ergotised seeds affects the nervous system, resulting in a swaying, staggering gait. A kind of drunkenness is produced. Some cattle, although already intoxicated, may continue to feed greedily on these seed heads. If much ingested, the animal may go down and be unable to rise for some time. Affected run cattle may become aggressive if approached.

The obvious line of treatment is to remove stock from affected areas if possible. Losses directly due to this condition are very rare, and recovery follows the removal to areas free from paspalum.

This ergot poisoning must not be confused with ergot of rye or fescue poisoning. In these latter the symptoms will be inflammation and perhaps sloughing of the extremities, such as the feet, ears, and tail.

Staggering and nervous symptoms may also be seen in some cases of ragwort poisoning.

Spring Grass Staggers

Taking that disease of dairy cows commonly known as "grass staggers," a more suitable name might be "spring grass staggers," because it is almost invariably encountered on spring feed, the quality rather than the quantity being the influencing factor. When feed begins to grow in the spring on well-farmed dairy land this disease may occur among cows calved from about two weeks to two months and usually from about June to October. A deficiency of magnesium in the blood stream is found in affected animals, and while the cause of this deficiency is not thoroughly understood, the result is frequently a severe disturbance of the nervous system.

In very acute cases of grass staggers no staggering symptoms may be noticed; the animal suddenly falls in a fit, from which it may or may not recover. In less acute cases great nervousness and jumpiness may be the most pronounced symptom, and if interfered with, the animal may fall in a fit. There is also the sub-acute type, showing inco-ordination or staggering, but nervousness may not be pronounced. Again, there is the type which staggers or sways slightly in its movements, this condition perhaps remaining for some time. In not so acute cases there may also be a tendency for the animal to lick various objects or itself aimlessly.

The administration of magnesium sulphate (Epsom salts) by mouth, under the skin, or into blood stream is recommended in affected cases.

Milk Fever

Inco-ordination or staggering is also a symptom of milk fever, which usually occurs within three days or so after calving, the causative factor being a deficiency of calcium in the blood stream. This deficiency again brings about a serious disturbance of the nervous system, with consequent staggering movements, which quickly terminate in complete inability to stand. Coma and death usually follows if the animal is not treated.

The administration of calcium in some form by one of the above-mentioned methods will repair the deficiency and usually effect a cure. Inflation of the udder also gives good results, possibly due to its temporary suppression of secretion of milk in the udder, thus making available for the system calcium which would otherwise be called on in the secretion of milk.

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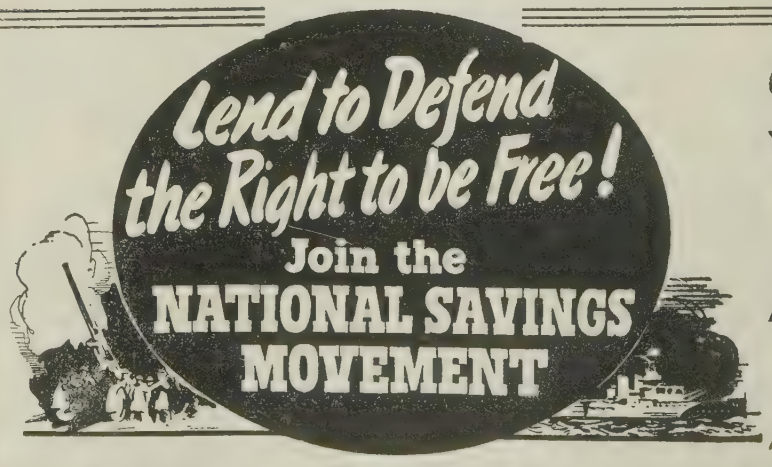

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Fertiliser Notes

By the FIELDS DIVISION

POTASH SUPPLIES IN WARTIME

Attempts to Find Alternative Sources

THE position of potash supplies is of great interest to farmers in different parts of New Zealand, and mixers of fertilisers, freezing works, and market gardeners are also affected by stocks of this commodity. In an article in the September, 1940, "Journal" the position was briefly reviewed and methods of replacing normal sources of supply were mentioned. Previously most of our potash supplies came from Germany and France, but since the outbreak of war and the withdrawal of France these sources have become unavailable.

The position in September has since been altered by the opening up of other sources of supply, notably the United States of America. It is also probable that supplies will shortly become available from Palestine.

Up to the end of 1939 some 18,396 tons had come into New Zealand. In 1940 7562 tons were imported. This last figure, although not in any way sufficient to meet normal national requirements, is adequate to meet really essential demands, and, because of the necessity of conserving shipping space, it is probable that much more high-grade material will come into New Zealand. This will replace the favourite 30 per cent. potash manure salts.

Alternative Sources

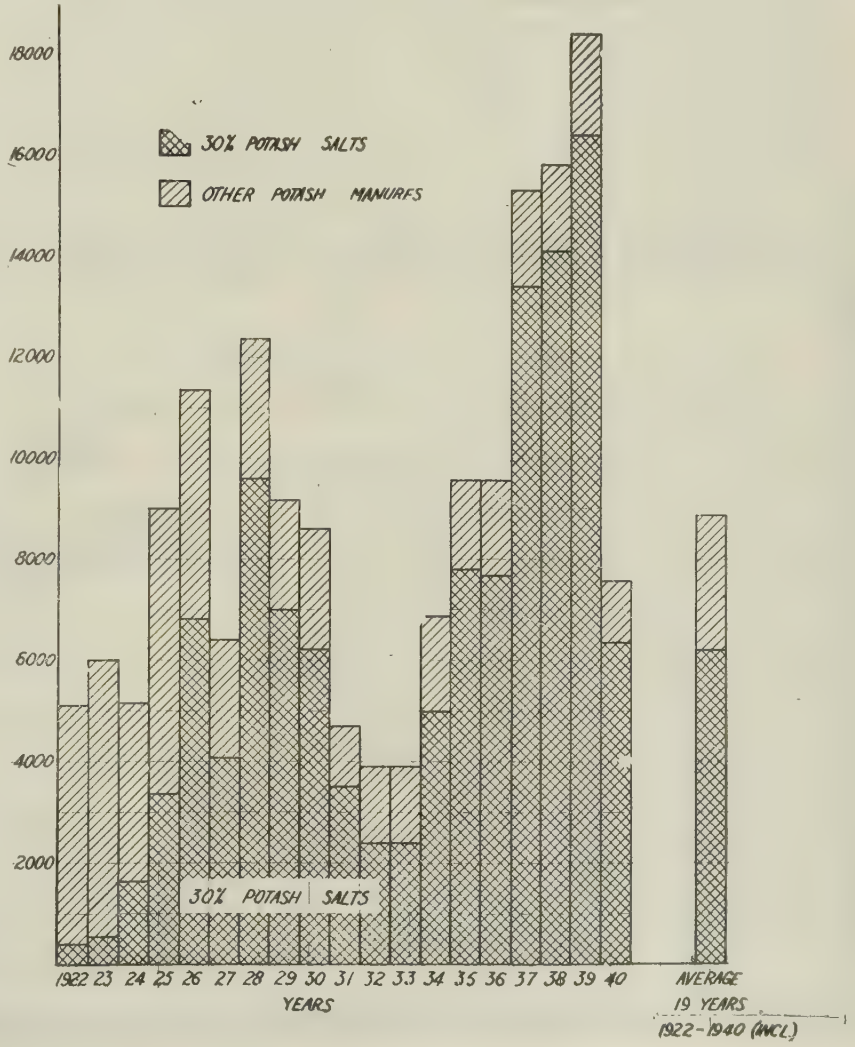
It is interesting to review the attempts to find alternative sources of supply in this country. Two main avenues for research presented themselves. The first was from the glauconite deposits near Waimate, and the second was the utilisation of one of the kelps plentiful around the coast of parts of the South Island.

There is little doubt that glauconite, a mineral containing some 6 per cent. of potash, is unlikely to be satisfactory as a source of potash, as the cost of extraction and the processing of the material is likely to make it too expensive.

In September last it was thought that the supplies of the seaweed Macrocystis were sufficient to produce very large amounts of potash, provided that some satisfactory method of handling the material could be evolved. It is too early to make a definite statement on the position, but the detailed evidence to hand indicates that, even if the whole of our supplies of seaweed were converted into potash, it would not make a very great contribution to our total requirements. The cost of producing the material in a form ready for application may also be high. However, it is possible that small units, privately worked, may be able to sell the material in a marketable form at a price comparable to or less than that of the imported article.

Economy of Potash

As a result of field trials carried out by officers of the Fields Division and



support from successful farmer users, it is possible to outline the areas on which this fertiliser is an economic factor in the production from pastures and yields of crops. There is ample evidence to prove that grassland in the Waihi, parts of the Waikato, North Taranaki, and Southland districts give increased returns where potash is included in the topdressing applied. Investigational work both overseas and in New Zealand has made it possible to indicate just which crops benefit from the use of this fertiliser. In the Dominion potatoes, tobacco, and mangolds are the three in this category most commonly grown.

Under present conditions, when potash is in short supply, the time is opportune for the introduction of controlled distribution so that this useful fertiliser may be made available in sufficient quantity where experience has proved it to be most valuable. At present a proportion of potash is used in both crop and pasture topdressing manurial mixtures in so small a quantity per acre and on areas not known to be deficient that wastage must inevitably occur, and the purchaser induced to spend money with poor prospect of payable return. Since accurate information on the economical distribution of potash is available this knowledge should be applied at all times, but particularly when fertiliser is in short supply and the necessity for maintaining economical farm production at a high level is so great.

Results from Trials

In the September, 1940, issue of the "Journal" the investigational programme was outlined, and to date five duplicated series of observational topdressing plots have been established in each of the Waihi and North Taranaki districts known to respond to applications of potash in combination with phosphate. From these areas laid down last spring it is interesting to note that the response from ground dried seaweed containing 17 per cent. potash, applied at the rate of 4 cwt. per acre, appears to be equal to that from 30 per cent. potash salts used at 2 cwt. per acre. Plots which received glauconite, containing approximately 6 per cent. potash at the rate of 1 ton per acre, show a very small response, and present indications are that this form of potash will not warrant further investigation when these trials are completed. Pasture samples from which the uptake of potash by the herbage will be measured are being taken at regular intervals from the plots in this series, and as the Southland areas will be laid down early this autumn a useful set of figures on which recommendations can be based should become available.

In projects of this nature farmers who are using any form of potash other than or in comparison with the 30 per cent. salts can be of considerable assistance if they will inform their local instructor of any results or observations they make on the effect of the potash used either on pastures or in crop mixtures. It is only by accumulating and summarising results from a number of sources, and preferably during at least three seasons, that really reliable data can be secured, and the help of users generally will be appreciated when any fertiliser problems are under investigation.

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All-year-round Fattening of Pigs Has Become an Economic Possibility

Trial Proves Value of Sugar Beet As Bulk Supply Feed For the Winter

— By —

M. McG. COOPER, Lecturer in Dairy Farm Management, Massey College, and

A. JOHNSON, Supervisor of the Wellington District Pig Council.

THE excellence of sugar beet for the winter feeding of pigs has again been demonstrated by the results of a feeding trial recently conducted by the Wellington District Pig Council on a farm in the Shannon district. The trial confirms the very encouraging results obtained with sugar beet last year in South Taranaki by Mr. C. J. Hamblyn, Fields Superintendent, Department of Agriculture.

Two comparable groups, each consisting of eight Tamworth and Tamworth-cross pigs, were constituted. Each group was run in a grass pen, one-third of an acre in area, and provided with an open-fronted house. The conditions under which the pigs were accommodated were good, but in no sense could they be described as exceptional. In fact, they were typical of a large number of dairy farms in the Manawatu district.

The basic ration of each group was ½ lb. of meat-meal per pig daily and sugar beet to appetite. One group was fed 1 lb. of kibbled barley per pig daily in addition to the basic ration. For the other group the supplement was ½lb. of crushed barley per pig daily. The barley was home-grown and, due to unfavourable conditions at harvesting, was not a good sample. The husk was not separated from the kernel.

The differences in regime were not considerable. In planning the experiment it was decided to conform as closely as possible to the owner's wishes that the pigs be brought through the winter in as good a condition as possible, having regard to cost of feeding.

Feeding Routine

The following feeding routine was adopted. The meat-meal was fed dry at 7 a.m. Sugar beet, including roots and tops was fed at midday in sufficient quantity to last till the next day. The daily consumption of roots varied from 12 to 16 lb. per pig. The barley was fed dry in wide-bottomed troughs at 4 p.m. Feeding the barley to the pigs at this time and in this way resulted in their eating it slowly, with the result that the barley was by all appearances utilised efficiently. Fresh water was provided each day, but in neither group was consumption very high, amounting to only ½ gallon per pig daily.

The trial was started on June 13, and lasted 57 days, until August 9. The pigs were weighed at the beginning of the experiment, during trial, and at the conclusion. The results of weighings are shown in the tables on page 175.

Although over the course of the trial Group A showed an increase of 28 lb. more than Group B, it was obtained at the expense of feeding 228 lb. more barley. On the face of things, it would seem that it did not pay to feed the extra ½lb. of barley daily. However, no claim can be made for significant differences between the groups. Individual differences between pigs and errors in weighing could more than account for the weight differences observed. It is of some importance that Group B pigs ate rather more sugar beet than Group A pigs, and this no doubt compensated for the differences in concentrates to some extent.

The important point that does emerge from the trial, however, is that moderately well-grown store pigs placed on a ration of 1½ to 2 lb.

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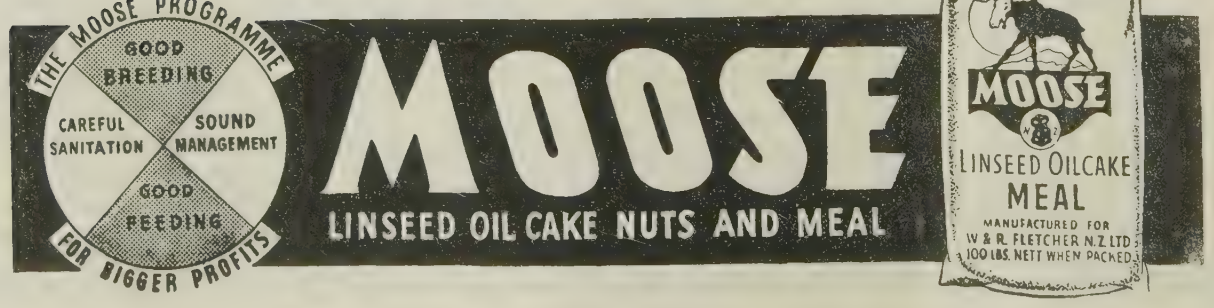

of concentrates, including ½lb. of meat-meal, as a supplement to sugar beet, were able to make a liveweight gain of approximately 1 lb. per day through the winter. Further, the pigs carried plenty of bloom, and the majority could have been slaughtered at the conclusion of the trial to make prime carcasses.

In other words, approximately 4d. worth of pig flesh was produced by feeding 1½d. to 2d. worth of concentrates, leaving 2d. to 2½d. to be credited to sugar beet. With the 40-ton crop of sugar beet which was secured on the farm, this means that the gross return was between £45 and £55 per acre—indeed a profitable crop.

There are wider implications of the trial than the mere growing of a highly successful farm crop for pig feeding. It means that if sugar beet is grown in large quantities this season, thousands of pigs which would normally be slaughtered as light porkers next autumn or sparsely wintered as unthrifty stores could be taken very close to bacon weights by spring, to be topped in a matter of three or four weeks on milk or whey.

As a war measure this would be of tremendous value in increasing supplies of bacon to Great Britain. As a peace-time practice, it means that sugar beet supplies a very much needed function as a bulk supply feed of good value to dovetail with the highly seasonal supplies of dairy by-products. Further, with good housing and management and the intelligent use of supplements, the all-year-round fattening of pigs has become an economic possibility.

The writers wish to thank Mr. Moynehan, Shannon, for the facilities he provided to make the conduct of the trial possible.

WHAT THE TRIAL SHOWED.

1. Moderately well-grown store pigs placed on a ration of 1½ to 2 lb. of concentrates as a supplement to sugar beet gained approximately 1 lb. liveweight per day through the winter.

2. With the 40-ton crop of sugar beet, the gross return was between £45 and £55 per acre.

3. With this programme, thousands of pigs could be taken close to bacon weights by spring, to be topped in three or four weeks on milk or whey.

4. As a war measure it would help to increase the supplies of bacon to Great Britain.

5. As a peace-time practice it is an excellent bulk supply feed to dovetail with the highly seasonal supplies of dairy by-products.

GROUP A.

(½lb. meat-meal, 1½lb. kibbled barley, and sugar beet to appetite per pig daily.)

Pig No.	Initial Weight 18/6/40.	Intermediate Weight 18/7/40.	Final Weight 9/8/40.	Gain.
2	82 lb.	135 lb.	155 lb.	73 lb.
3	85 ,,	140 ,,	165 ,,	80 ,,
6	55 ,,	80 ,,	100 ,,	45 ,,
8	75 ,,	110 ,,	130 ,,	55 ,,
9	68 ,,	95 ,,	115 ,,	47 ,,
10	80 ,,	120 ,,	140 ,,	60 ,,
14	80 ,,	115 ,,	140 ,,	60 ,,
16	80 ,,	120 ,,	135 ,,	55 ,,
Total weight	605 lb.	915 lb.	1,080 lb.	475lb.
Ave. weight	75.6 lb.	114.4 lb.	135 lb.	59.4lb.

Average daily rate of gain per pig: 1.04 lb.

GROUP B.

(½lb. meat-meal, 1 lb. kibbled barley, and sugar beet to appetite per pig daily.)

Pig. No.	Initial Weight 13/6/40.	Intermediate Weight 18/7/40.	Final Weight 9/8/40.	Gain.
1	80 lb.	130 lb.	150 lb.	70 lb.
4	64 ,,	90 ,,	100 ,,	36 ,,
5	65 ,,	105 ,,	130 ,,	65 ,,
7	75 ,,	110 ,,	130 ,,	55 ,,
11	70 ,,	115 ,,	130 ,,	60 ,,
12	80 ,,	115 ,,	133 ,,	53 ,,
13	90 ,,	110 ,,	140 ,,	50 ,,
15	77 ,,	115 ,,	135 ,,	58 ,,
Total weight	601 lb.	890 lb.	1,048 lb.	447 lb.
Ave. weight	75.1 lb.	111.3 lb.	131 lb.	55.9lb.

Average daily rate of gain per pig: 0.98 lb.

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HAMILTON: 175 Victoria Street. Telephone 2178. After hours—M. C. Tierney, Telephone 2162. Hamilton. C. N. White, Telephone: 39W, Ngaruawahia.

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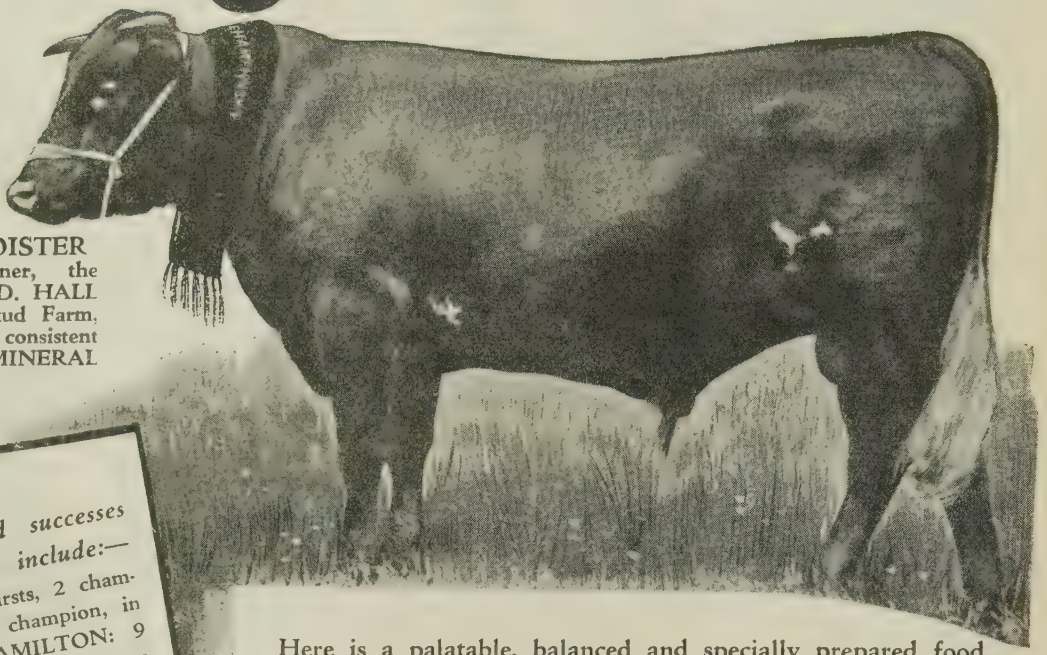

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An Auckland Farmer Discusses—

By J. JOHNSTONE,
Manurewa, Auckland.

Rotational Grazing For Winter Feed

The system of grazing management and pasture utilisation described by this farmer writer has been practised for a number of years quite successfully, and has been investigated by an officer of the Fields Division of the Department. Readers should note that fields are fed off after relatively short periods of spelling, and that this fresh growth is not grazed closely at any time, thus encouraging maximum recovery. While the system described has proved successful for the raising of beef cattle, its value for sheep and dairy cows has not been demonstrated, and the provision of ample reserves of hay and ensilage for periods of low pasture production, inevitable under any method of rotational grazing, is essential.

ONE of the problems Nature presents to the farmer is that of dealing with the enormously uneven yield from his pasture during a year. A large part of the year's growth, probably more than a third, will be produced during October, November, and December, while for considerable periods in many years Nature will take a holiday and allow the growth to stop. As all farmers get the maximum growth in the same months, it is impossible for all of them to purchase additional stock, and the increased competition causes a seasonal rise of prices which makes it difficult, if not impossible, to reap profit from any additional stock that may be purchased.

Part of the spring surplus may be preserved as hay or ensilage to be consumed during the winter or in time of drought, but this method involves serious losses. Grass intended for hay will be allowed to reach the flowering stage, and so will deteriorate in quality. The drying process will deprive it of much of its digestibility, and the rains that are certain to fall on much of it before it reaches the stack will wash out much of its nourishment. Much labour is involved both in the saving and feeding out of hay or ensilage, and the paddocks suffer, both from their enclosure for too long a period and from the tramping caused by the cattle rushing after the hay cart.

Storing It Green

Can all this be avoided? Can the surplus grass produced in the spring be carried forward for winter use without deterioration and without expenditure of labour? The writer believes it can by employing a method of pasture management which is familiar to all of us, although it must be practised in a special way and with a purpose different from those it is usually intended to serve.

Let us suppose that a farmer has, at least through the winter, not been practising rotational grazing, and let us assume that he has seven paddocks available for grazing. When he finds his grass gaining on his stock, say, at the beginning of October, he will enclose them in one paddock. As his pasture is little above the necessary grazing height, he will, during the first rotation, shift his stock each day, thus grazing his seven paddocks in a week. His first paddock will then have been freed from the stock for six days, and because of the accumulation that will have occurred, he will, in the second rotation, graze each paddock for two days, the period of the rotation being thus extended to a fortnight.

This process will be continued, the grazing period being lengthened by one day for each succeeding rotation. About the middle of January the grazing period for each paddock will be five days, the whole rotation occupying 35 days and each paddock being enclosed from the stock for 30 days, a term considered quite satisfactory in rotation grazing as ordinarily practised.

Our farmer will then have accumulated during the best months of the year one month's growth in one paddock, with evenly diminishing amounts in the other six, the average accumulation for the whole area being a fortnight's growth. A fortnight's growth over the whole farm is equivalent to six weeks' growth over one-third of it, or the equivalent in bulk of about the usual hay crop. The quality of the grass saved will, of course, be superior to the quality of any hay or ensilage, and it will have been accumulated for future use without expenditure of labour and with benefit to the pasture in place of injury.

Using the Accumulation

All that is necessary for the winter use of the feed that has been accumulated in the spring and preserved in the paddocks by the ordinary method of rotational grazing is the reversal of the procedure followed in the spring. When the farmer finds the growth insufficient for the requirements of his stock he will reduce the grazing period from five to four days, and will continue that process of reduction until, near the end of the winter, he will be shifting his stock every day, after which continuance of rotational grazing will be useless. His accumulation will have been consumed, and he will be ready on the coming of spring to proceed to build up a fresh accumulation of feed.

The supply of grass made available by this method of grazing at the beginning of winter will not, in most seasons, be equal to the supply accumulated during the spring, as a fortnight's growth in the late autumn is not likely to be equal to a fortnight's growth in the early summer, but the excess will have been used up during the summer when it was probably needed, so that none of it will have been lost.

In a severe drought the whole amount saved in the spring may, of

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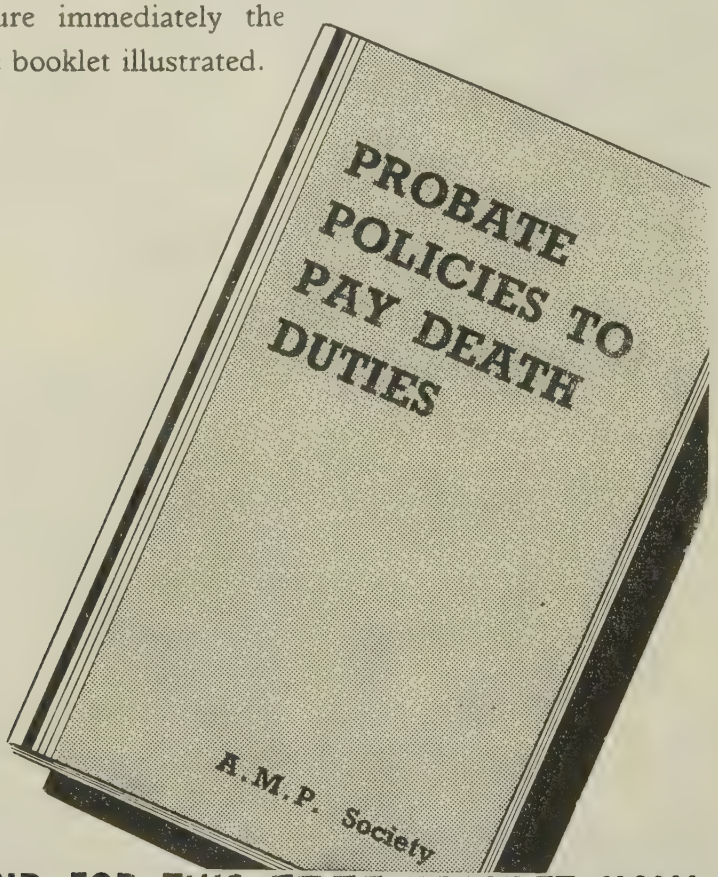

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course, be consumed, and the farmer may then build up a fresh supply for the winter when the autumn growth—usually abundant after a drought—allows it. Consumption may, in fact, be evened out over the whole year by lengthening the grazing periods whenever the growth is gaining on the stock and shortening them whenever the stock are gaining on the growth.

The Grazier's Flywheel

Thus, rotational grazing practised in this way can be made to serve the grazier much as the user of power is served by the flywheel of the engine which absorbs and stores up power when the output is in excess of requirements, to give it out again in useful work when the requirements exceed the output. Feed is saved up (without effort) whenever its growth exceeds requirements, to be fed out to the stock (also without effort) whenever the requirements exceed the growth, and the growth allowed, which is never more than a month from one grazing to the next, is no more than the amount thought to give the best results with rotational grazing as ordinarily practised.

It is not, of course, claimed that this form of controlled grazing can be relied on to provide a complete substitute for hay and ensilage, but it is confidently claimed that it can be made to take the place of the larger part of the hay making that is now done, with real and substantial gains, both in the quality of the feed provided and in the labour cost of saving and feeding.

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A LIMITED supply of .303 ammunition is now available for sale to farmers and local authorities for the specific purpose of destroying wild pigs. This ammunition is obtainable on application to the Storekeeper, Internal Affairs Department, Government Buildings, Wellington, or from the Custodian, Government Buildings, Christchurch. The cost of the ammunition is 2/- per 100 rounds, plus freight, and orders for less than 100 rounds will not be accepted. All orders must be endorsed by the local Inspector of Stock as a guarantee of the bona fides of the applicant and an indication that the ammunition is required for wild pig destruction purposes.

Tuberculosis In Cattle

THE number of cattle condemned under the Stock Act for tuberculosis during the last financial year amounted to 6569 head, being 5619 condemned on clinical symptoms and 950 reactors to the tuberculin test. In each case compensation was paid in accordance with the provisions of the Act. The tuberculin test was applied to 17,877 cattle, of which number 950 reacted, giving a percentage of 5.3.

The total number of cattle, exclusive of calves, examined at the various abattoirs and meat-export slaughterhouses was 518,201, an increase of 13,595 on last year's figures. Of these, 39,812, or 7.68 per cent., were found to be affected with tuberculosis in varying degree, a large percentage being only slightly affected. This indicates an increase of 0.11 per cent. infection amongst cattle slaughtered in these premises.

So far as the tuberculin testing of herds is concerned, the position is a voluntary one. It is, however, interesting to note that 14,458 cattle were tested at the owner's request.

Although a system of clinical examination of the dairy herds supplying milk for human consumption is combined with the biological test of composite milk samples from dairy herds, it still appears desirable to have all herds supplying milk subjected to the tuberculin test at regular intervals.

—*Director of the Livestock Division.*

Answers to Correspondents

Cleaning a Skim-milk Pipe Line.

J.L. (NELSON)—

I would be very much obliged if you would let me know if there are any serious objections to the use of the "caustic soda solution" for cleaning a skim-milk pipe line.

I have been using the solution (as recommended by your Department) for cleaning my milking machinery for the past few seasons, and find it very satisfactory, so thought it would be an easy matter to use it in the same way for a skim-milk line. I might say that I will be using new galvanised pipes without any pump.

If the above method is not satisfactory I would be very grateful if you would tell me of the method you do recommend.

DAIRY DIVISION—

Caustic soda solution is not satisfactory for cleaning galvanised skim-milk pipes. There is always a danger that some will remain in the pipes and get mixed with the next lot of skim-milk put through them and endanger the health of the pigs. It will also remove the zinc, and this also has been found to cause trouble.

A little molasses dissolved in hot water has been found to keep the pipes clean, and it will do no harm if run into the skim-milk tanks.

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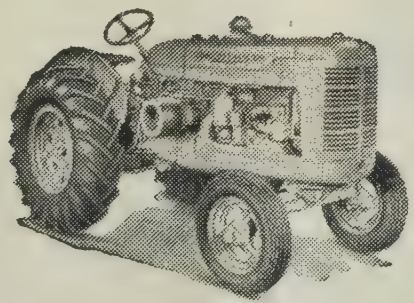

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HOW TO DISTINGUISH BETWEEN SUBTERRANEAN

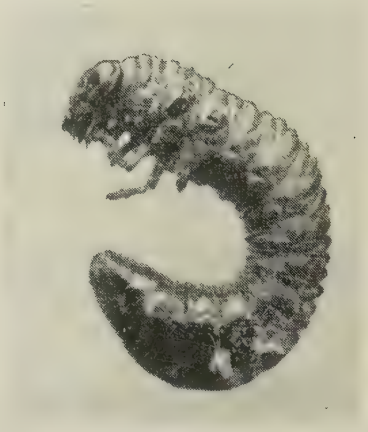


Fig. 1.—The Adult Insect. A small, brown, hard-backed beetle, which flies at dusk in November. There is no evident difference between males and females.

Fig. 2.—The Injurious Stage. The grub is small and white, and it is characteristically curled into a horse-shoe shape.

Fig. 3.—Feeding Habits of Grub. The grubs are found among the grass roots about one inch below the surface. They are not in a definite tunnel, and they feed only on the grass roots.

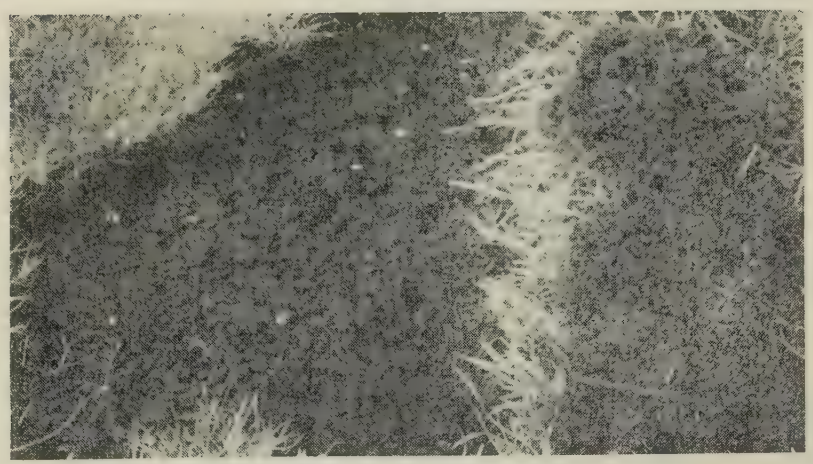
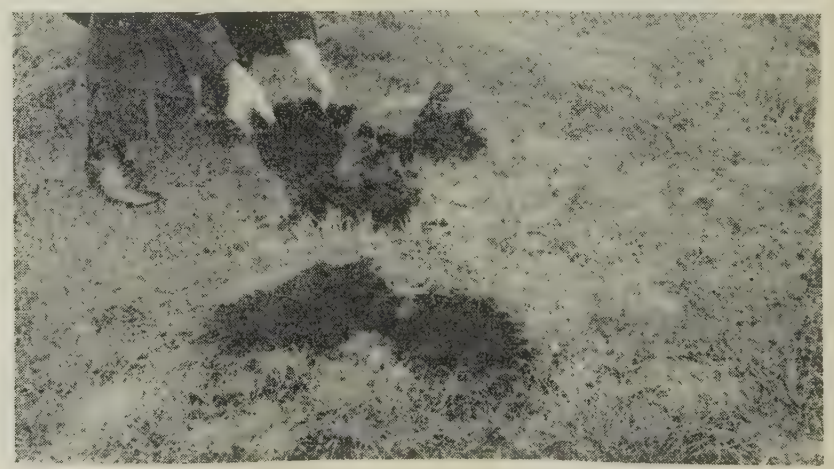


Fig. 4.—Resting Stage or Chrysalis. This stage does not feed, and it may be found in a cell in the ground during October and November. It is white and the appendages project from the body.

Fig. 5.—Symptoms of Damage to Pasture. The grass dies in patches because the roots are destroyed. The sward is not thinned out but dies in position. The turf may be pulled up and rolled back. The sponginess of the ground is characteristic.



THE GRASS GRUB AND THE GRASS CATERPILLAR

By

L. J. DUMBLETON,
Division of Entomology,
Scientific and Industrial
Research Department,
Cawthron Institute, Nelson.

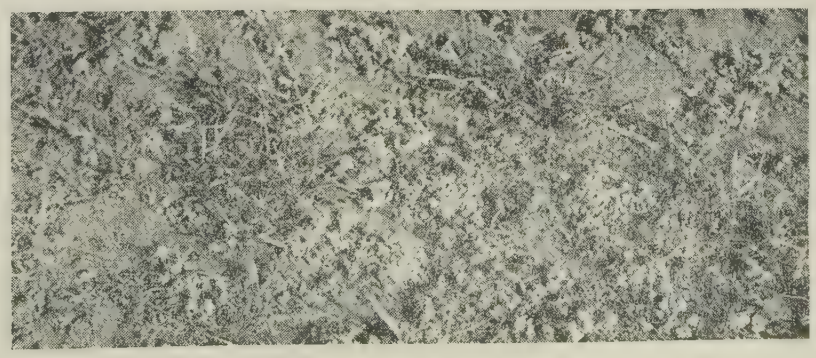
Fig. 6.—The Adult Insect. A large, dark-brown or grey moth, which flies at dusk in October. Males (above) are usually smaller than the females (below) and show the wing markings more plainly.

Fig. 7.—The Injurious Stage. The caterpillar is up to two inches in length and a dirty grey or green colour. It is not curled up.

Fig. 8.—Feeding Habits of Caterpillar. The caterpillars are found in definite tunnels which may go down six to nine inches into the soil. They feed on the leaves and crowns of the grass plants.

Fig. 9.—Resting Stage or Chrysalis. This stage does not feed and it may be found in the tunnel in September and October. When the moth has emerged the empty case remains in the mouth of the tunnel, or lies on the ground. It is chestnut-brown in colour and the appendages are folded close to the body.

Fig. 10.—Symptoms of Damage to Pasture. The sward is thinned out, since the caterpillar feeds on the leaves and crowns. The turf is not loosened and the ground remains solid. The "casts" round the opening to the tunnel are composed of lumps of soil and pieces of grass webbed together with silken threads.



How To Distinguish Between The Grass Grub And The Subterranean Grass Caterpillar

GRASS grub and subterranean grass caterpillar are the most serious pests of improved pastures in New Zealand. Both insects are native to New Zealand. The activities of either of these two insects may result in the complete destruction of a part or of the whole of a pasture. In the past, and to a large extent at the present time, the damage done by these two insects has been confused by many farmers. It is true that both may occur in the same paddock, but usually one of them is preponderant in a pasture which is seriously damaged.

This illustrated account is published for the information of farmers in view of the necessity for distinguishing between these two insects for the purposes of applying control measures, as the treatments which show some prospect of controlling the subterranean grass caterpillar are not effective against the grass grub.

The Grass Grub

There are several native species belonging to the species *Odontria*, but the one which is responsible for most of the damage is *Odontria zealandica*.

The adult insect is a small brown beetle 3-8ths of an inch long (Fig. 1). The adult beetle of *O. zealandica* is variously known as "grass grub beetle," "brown beetle," "turnip fly," or "cockchafer." The beetle itself does some damage to germinating cruciferous crops and to fruit trees and ornamental trees by feeding on the leaves. It flies at dusk, usually about the middle of November, and is often attracted to lights in large numbers. Other species of *Odontria* may fly earlier or later than *zealandica*.

Early Stages

The eggs are laid in the soil by the female beetle, which burrows into the soil for that purpose, and are hatched in about a fortnight. The larval stage is variously known as "grass grub," "white grub," or "curl grub" (Fig. 2). It is a white grub, usually curled up into a horseshoe shape, and found

Continued from previous page.

lying in the soil among the roots of the grass about an inch or two below the surface (Fig. 3). The young grubs are present from December onward, but are at first very small.

The grass grub feeds on the roots of grasses, clovers, etc., but it may also exist and develop in fallow ground, provided there is sufficient humus in the soil. It does not form a definite tunnel in the soil, but when large numbers of grubs are present the ground becomes spongy and yielding because of the loosening and pulverising of the soil about the grass roots. The grubs are present until about late September or early October, when they are full grown and begin to change into the pupal stage.

The pupa or chrysalis (Fig. 4) is found in a cell in the soil. It is small, and in its early stage is creamy white, but later the brown colour of the developing beetle shows through the skin. The fully developed beetle may be found in cells in the soil for a week or two before the main emergence and flight of the beetle about mid-November.

The damage (Fig. 5) done by the grub consists in the severing of the roots of the plant and the loosening of the soil about the roots. Both of these cause the death of the grass foliage through starvation and lack of water. The brown patches of dying grass are characteristic of grass grub damage in the early stages, and this type of damage appears about March or April. In such patches the turf may be pulled up with little resistance and rolled back like a mat. Pastures and crops may be damaged within the first year after sowing.

Difficult to Control

There is no method of control which can be recommended for exterminating the grass grub or preventing attacks in extensive areas of pasture. Rolling with a heavy roller helps to consolidate the ground and to allow the grass to root again. The feeding out of hay, etc., on infested ground helps to reseed the ground, and the trampling of the stock consolidates the ground and probably kills a number of the grubs. On small areas, such as lawns, grass grub damage can be prevented by topdressing with lead arsenate at a rate of 5 to 10 lb. per 1000 square feet.

Find the area, in square feet, of the piece of lawn which you want to treat. Buy enough lead arsenate powder to treat this area at the rate of 1 lb. of lead arsenate per 100 square feet of lawn. The cost of lead arsenate is about 1s. per lb. The lead arsenate should be thoroughly mixed with fine-screened, dry soil or sand at the rate of 1 lb. of lead arsenate to 1 peck (14 lb.) of sand or soil. This is to facilitate the even distribution of the lead arsenate over the area to be treated. This mixture of lead arsenate and soil or sand is then broadcast evenly over the area at the rate of 1 lb. lead arsenate per 100 square feet—that is, 15 lb. of the mixture of soil and lead arsenate per 100 square feet. It is applied to existing turf, and should be applied when the grass is dry.

For bare patches the mixture is applied at the same rate, and can be worked into the top 1 inch of soil before the grass seed is sown, or it can be applied as a topdressing after the grass seed is sown.

This treatment is reported to be effective for about five years—the lead arsenate remaining in the soil and poisoning any grass grubs which develop in it.

The treated area can be topdressed in the spring with equal parts of superphosphate and ammonium sulphate, applied at the rate of 1 oz. per square yard.

The Subterranean Grass Caterpillar

There are several species of subterranean grass caterpillar belonging to

the genus *Oxycanus*, but the species which does most damage is probably *Oxycanus cervinata*. Its specific identity is not certain, but its life history is tolerably well known.

The adult insect (Fig. 6) is a large, dull-coloured moth with a length of body of about 1 inch and a wing expanse of about 1½ inches or more. It has no common names, except perhaps "Porina Moth," and it does no damage in the adult stage. It flies at dusk, usually during October, and is often attracted to lights in large numbers at that time. Other species of *Oxycanus* may fly later than October.

The eggs are deposited on the surface of the ground and hatch in about one month.

Caterpillar to Moth

The young caterpillars are present from late November onward. They are very small at first, and appear to feed for a month or so under cover of a silken web on the surface of the ground among the crowns of the grass plants. After that, the caterpillar makes a definite tunnel (Fig. 8) more or less vertically into the ground, and it lives and shelters in this by day and emerges at night to feed on the leaves of the grass. It is protected to some extent by a covered runway of soil and dead grass bound together with silken threads, and these "casts" are a characteristic symptom of the presence of the insect. Unless they are in great numbers the caterpillars are too small to do much damage to the pasture until April or May.

The caterpillars are full-sized about the end of August. They are then about 2 inches to 2½ inches long and a dirty greyish green in colour (Fig. 7). The caterpillars are commonly known as "grass caterpillar" or "Porina caterpillar." The caterpillar changes to the pupa or chrysalis in its tunnel about the end of August. The chrysalis (Fig. 9) is about 1 inch long and chestnut-brown in colour, and is capable of wriggling movements up and down the tunnel.

The chrysalis stage lasts about six weeks, after which the chrysalis wriggles up to the surface of the ground, where the chrysalis case splits and the moth emerges.

The damage (Fig. 10) done by this insect is entirely to the crowns and foliage of the grass plant and not to the roots, as in the case of the grass grub. The characteristic damage by the grass caterpillar is a thinning-out of the sward and not a dying-out of the grass, as in the case of grass grub. In heavy infestations whole paddocks may be completely bared of grass by June. Pastures are not, as a rule, damaged in the first year after sowing, but cases are known where the caterpillars have survived cultivation and damaged crops, such as barley. Even under conditions of high rainfall there is a poor recovery of the grass, which is replaced by daisies and dandelions, while in drier areas hairgrass and other weeds come in.

Method of Control

The control of this insect is still under investigation, but promising results have been secured with the following poison bait:—

One pound Paris green, 25 lb. bran; mix thoroughly while dry.

Eight pounds molasses, 3 gallons water; dissolve the molasses in hot water.

Add the molasses solution to the bran and Paris green, and mix thoroughly until the bait is moist but not sloppy—that is, it must crumble easily and not stick together.

Broadcast the bait at the rate of 60 lb. of wet bait per acre. The bait should be applied as soon as it becomes evident that the pasture is being severely thinned out by the caterpillar, which may be as early as May or June. The earlier it is applied the better is the chance of the grass recovering. There is probably little use in applying the bait in August, as the caterpillars have largely finished feeding by the end of that month.

The cost of materials is about 6s. per acre. Paris green costs about 3s. per lb., and should be obtainable from firms supplying insecticides and spray materials to gardeners and orchardists.

Before the above control measure is applied the farmer should make certain that the damage is due to the caterpillar and not to the grass grub. This can be done by digging for caterpillars. In heavily infested ground an average of five to ten caterpillars per square foot may be found.

All the photographs are by Harvey Drake, with the exception of Fig. 6, which is by W. C. Davies.

Mastitis Research

EXPERIMENTS have been inaugurated to test the effect of milking machine adjustments on the incidence of mastitis in an experimental herd. Research is being undertaken in connection with the evolution of a standard milking machine, with particular attention to the mechanical simplicity and durability, milk hygiene, and the effect produced on the udder. Observations have been made on the effect of milking machines on the production of mastitis in a number of dairy herds. Consideration is being given to the possibility of testing the performance of milking machine accessories.

A committee has been set up to co-ordinate the work in connection with milking machines, and the gratitude of the Department is due to the representatives of the Dairy Board and the Taranaki Federation of Dairies, as well as to the Director of the Dairy Research Institute, who have served on this committee.

Regular observations have been made on the occurrence of mastitis in two experimental herds. General field observations have been made on the occurrence of the disease in the Waikato. The mastitis-control scheme which has been operating in that district during the past eight years has been critically reviewed during this year and it is considered that this scheme will need considerable revision before it can be applied generally. It is hoped to start work in an experimental herd next year with a view to exploring the possibility of devising a more efficient control scheme.

A special bacteriological study has been continued with a view to determining the types of organisms responsible for mastitis in New Zealand. Preliminary work has been done to establish a technique for studying the effect of non-stripping.

—Acting Director, Animal Research Division.

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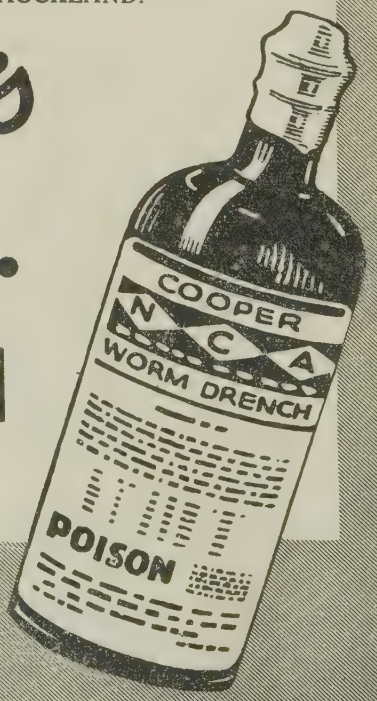

Veterinary Notes for the Farmer

Discussions on First-Aid Measures

Contributed by the Livestock Division

GUARD AGAINST WORMS IN CALVES

IN many districts the dairy farmer finds it difficult to rear his calves without one or more animals showing some symptoms of worms. When heifer calves are being reared for replacement purposes it is most important to see that these young animals get a reasonable chance to thrive during the early months of development.

The maintenance of good health free from setbacks and checks due to worms or other causes is the surest foundation for the future dairy cows of your herd. Many weedy two-year-old heifers have resulted from neglect of the young calves after weaning and throughout their first winter. A heavy infestation of worms has an undermining effect, which leaves permanent weaknesses in digestion and general health at a later age. All efforts should therefore be directed to preventing worms, treating affected calves, and building up sound, well-developed, healthy, foundation stock.

Symptoms

It is not difficult for the observant stock owner to see that his calves are not doing well even before the typical symptoms of worms are manifest. Unless the feed is good and plentiful there is a tendency for calves to slip after weaning. Such tendency is best checked by attending to the feed supply at once. A change of pasture is indicated. Coughing is frequently an early symptom, and may be indicative of either lung worms or stomach worms or both. There is a tendency for the calves to become pot-bellied, a swelling under the jaw is not uncommon, and scouring later sets in. At this stage loss of condition is rapid, and some deaths may occur.

A post-mortem examination of a dead calf will show numerous small white, thread-like worms in the bronchial tubes of the lungs. If the true stomach is opened carefully along its upper border soon after death and the contents carefully examined, the minute worms will be seen moving about in a seething mass and adherent to the lining walls of the stomach. Similarly, the worms may be seen in various parts of the intestinal canal.

Treatment

The most successful line of treatment will depend on the circumstances at each farm. A change of pasture is desirable, and the calves should be removed from their normal paddock to a fresh pasture grazed by some other class of stock, such as horses, sheep or even adult cattle. The usual calf paddocks are notorious sources of worms. If the pasture is not good, supplement the grazing with ensilage, good hay or feed out some crop or provide a small daily ration of some concentrate, such as crushed oats and bran. A paddock from which hay or ensilage has been cut will be found very suitable, provided the aftermath is well grown. All care should be taken to rear young calves in well-drained paddocks, free from swamps and stagnant pools, as in wet paddocks parasitic trouble is a common cause of loss.

So far, the treatment of worms has been dealt with by management of the calf and management of its feed supply and surroundings. Although this will not appeal to many owners, it must be remembered by all that it constitutes the most important line of treatment. The administration of worm medicine must always be secondary to sound animal management and feeding. Certain districts are noted for the very fine yearlings produced, whereas other districts find it just as difficult to produce a crop of average specimens.

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Calf rearing might be considered a specialised line of production, not suitable to every farm or to every locality, but as it is so very important from the herd maintenance point of view, too much stress cannot be placed on the necessity of endeavouring to produce healthy youngsters by sound methods of feeding and management. There is no better sight than a good line of even type yearling heifers with bright eyes, sleek coats, free from coughs and scours, and well wintered during the first year.

Worm Medicines

Worm medicines which have been used in the treatment of affected calves have been varied from time to time, and new preparations are still coming forward. No single preparation can be considered as 100 per cent. effective, hence the changes that have taken place. It must always be remembered that prevention is better than cure, and that worm medicines must be considered secondary measures to good management and feeding.

Some years ago the use of a drench composed of a tablespoonful of pure oil of turpentine mixed in half a pint of raw linseed oil was considered a satisfactory drench, especially when lung worms were in evidence in addition to stomach worms. The drench was repeated once weekly until an improvement was brought about.

Later, because of the comparatively good results obtained from the use of the bluestone nicotine sulphate mixture in the treatment of worm infested hoggets, it was considered advisable to try the mixture on calves, and some good results have been reported following the use of the mixture. The mixture is prepared by dissolving 16 oz. bluestone in five gallons of water and adding 16 fluid ounces of 40 per cent. commercial nicotine sulphate. The dosage for calves of various ages is: Calves, four months, 3 oz.; six months, 4 oz.; nine months, 6 oz. No fasting is necessary when using this drench, but it is advisable to hold the calves in the yard for two hours after drenching. Drenching may be repeated every two or three weeks when dealing with seriously affected calves.

Many other preparations have been used from time to time, carbon tetrachloride, tetrachlorethylene, various preparations of iron, arsenic, and other recognised worm medicines. Attention has lately been directed to the use of phenothiazine.

Fumigation and the inhalation of chloroform have been tried in the treatment of the small worms in the lung tubes. Injections into the windpipe have been given with a view to the removal of this type of worm, but, as with worms in the stomach, no fully satisfactory lines of treatment can be depended upon to overcome lung worms. This condition of "hoose" in calves is inclined to be rather persistent.

The best line of attack against worms in calves is to feed well, change pastures, use well-drained paddocks to prevent re-infestation, build up constitution, and dose for stomach worms so that the affected animal will be able to throw off the attack by the lung worms.

Foul-of-the-Foot

FOUL-OF-THE-FOOT is a troublesome complaint which is quite commonly seen affecting one or more members of the dairy herd at this time of the year. The affected cow rapidly drops in her milk yield, and, because of the severe lameness and inability to get about and feed properly, there is a severe loss of condition.

In the early stages a swelling appears around the hoof, and lameness gradually becomes worse. If the foot is thoroughly cleaned out and examined, as it should always be, it may be found that there is a cut due to a sharp stone, a piece of glass or barbed wire. On the other hand, very little may be seen except the swollen area between the claws, even extending up to the

fetlock joint. Later, there is evidence of a deep-seated abscess forming in this region. The infection has gained entrance and suppuration is taking place in an imprisoned area ,and this accounts for the very severe pain.

Treatment

It is almost impossible at this stage to apply any dressing which will arrest the formation of the abscess. The common procedure, on the other hand, is to assist in the ripening of the abscess, by opening it up to allow the escape of the pus and then treating it as an open sore. An application of tar and tow is frequently fixed in between the claws to keep the area clean until the abscess bursts. The ripening of the abscess may be hastened by the application of strong iodine, by liniment or blister, or in some cases by the use of repeated poultices. Grass requires to be cut for the affected animal and taken to her in a house paddock, where milking may also be carried out so that as much rest as possible is provided for the affected foot.

The abscess should be well opened out to allow the free exit of all pus. Immerse the foot in a warm antiseptic foot bath, then dry and apply a protective covering of tar and tow in alternate layers. Wrap the foot in sacking, and provided all the pus has been removed, healing should be quite satisfactory.

At the best, these foot rot cases in cows are very difficult to deal with, and require much work and attention. Even then, an occasional case will crop up where the pus gets into a joint, and the results are anything but satisfactory. It is necessary to make an inspection to see if the cause of the first case can be tracked down so that further cases may be prevented. Pieces of barbed wire may be found imbedded in the mud at gate entrances or watering places in the paddock or about the shed. Any cows with overgrown or distorted claws should be attended to, as cows with overlapping claws are liable to foot rot. Foot trimming and paring will remedy any of these defects.

It is advisable to isolate the affected animal. In any case, for convenience of treatment and feeding and milking the cow will require to be kept near the house and shed.

Scald

Occasionally, a milder type of case is seen affecting calves. This type is more correctly described as a scald, affecting the space between the claws. The application of a dressing of tar in which some finely-powdered bluestone has been incorporated will frequently bring about recovery and prevent suppuration when the treatment is applied in the early stages. This tar ointment will be found useful to apply to the cow's foot during the healing stage, when there is frequently a tendency to the excessive growth of "proud flesh."

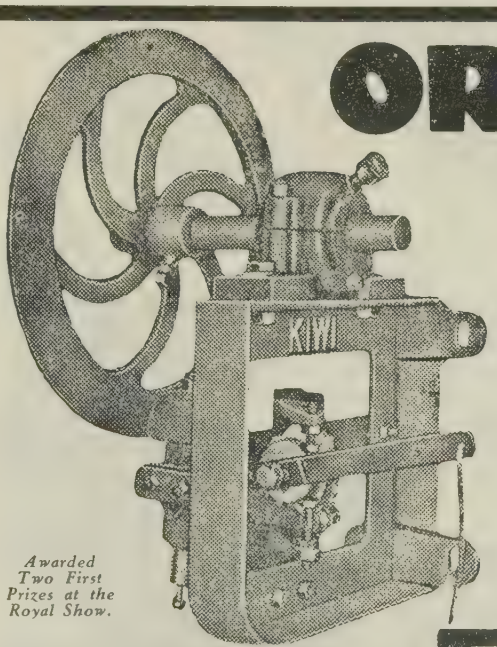
Answers to Correspondents

Sores on Cows' Teats

H. B. (WAIHI):—

I would be very pleased if you in your columns could advise me about sores on two of my cows' teats.

It starts with the teat becoming raw, a bit swollen, and red, very sore, and the cow kicks. It later forms a black



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scab, and tends to work to the button of the teat and close the milk channel or the hole. Under the sore or scab there is slight inflammation, and it tends to actually eat away the teat.

I have used various remedies without much success. One cow has had it for three months.

Could you advise with reasonable certainty whether any cure is known, and any information likely to be of use is welcome.

LIVESTOCK DIVISION:—

The trouble affecting your cow's teat is known as "black pox," an infection due to a dirt organism. Unless correct treatment is adopted in the early stages, satisfactory results are not easily obtained. When the end of the teat is involved, a mammitis with consequent loss of the quarter is a common result.

The affected cow should be milked last, or preferably by some person not engaged in general milking.

In the treatment of this disease, the following applications are recommended:—

(1) A 3 per cent. solution of salicylic acid in glycerine.

(2) Salicylic acid, 2 drams; Benzoic acid, 1 dram; Lanoline, 6 drams; petrolatum, 1 ounce.

Applications should be made at each milking period.

Lameness in a Sow

"COW COCKY" (APITI):—

I have a sow which about a week ago became very lame in one hind leg, and now it is a front leg. The sow went down when the second hind leg went, and dragged her hind legs. Now she can't even do that. The legs are sore to touch, but are not swollen.

LIVESTOCK DIVISION:—

Without some further particulars as to methods of feeding the sow and whether she had recently weaned a litter, it is difficult to give any definite advice. Possibilities are:—

(1) Mineral depletion of bones as result of having recently borne and suckled a big litter, which might result in soreness of the bones or even a fracture of the limb bone or spine. Such a condition is less likely to occur if milk is fed freely, but might be seen under whey feeding, with grain supplement, and absence of green feed.

(2) Arthritis, inflammation of joints. This is common in young pigs, and is often due to infection, dirty runs, etc., and sometimes to causes described under (1). In most cases there is some enlargement of a joint (stifle, hock, or knee).

(3) Injury due to fighting, falls, etc.

It would be advisable to treat the sow on general lines. If she is still taking her food, give 1 oz. Epsom salts in her feed once a day for three days. Also, add one tablespoonful daily of slaked lime (the type sold as garden lime is suitable) and one of codliver oil over two to three weeks. Keep the sow comfortable and bedded, and include milk and some green stuff in the feed.

The above measures would be justified only if the sow is a fairly good one. Otherwise, or if quite unable to get to her feet, it would probably be better to destroy her, as a fracture of a bone may have occurred.

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

Ovary Trouble in a Cow

W.A.M. (MARLBOROUGH):—

I have a cow that calved normally about two months ago, and at about three weeks she came in season and ever since then she comes on every few days, or she may miss for about a week, and stays on heat for about a day. I have washed her out several times with a weak solution of Condy's crystals. There is no discharge from her at all, and she is milking very well. Can you recommend any treatment for her, and would it be safe to put the bull to her?

Some of my lambs have a sort of scald between the toes. Is that footrot? Others do not seem to be doing as well as they should, and they are running on a good grass paddock. Do they require a drench, or would a lick be the best? I have a lick, I forget the name of it, but it has to be mixed with lime, super, and salt, but the ewes won't touch it or the cows either, but the rams go for it like one thing.

LIVESTOCK DIVISION:—

The cow has developed ovary trouble, and in the meantime I would recommend keeping her away from the bull altogether and getting her onto a lick until she comes back to her normal regular periods.

The lick recommended by this Department consists of equal quantities of steamed bone-flour (or bone-meal) and agricultural salt. These should be mixed and put out in boxes, and will be equally suitable for sheep or cattle.

With regard to the lambs, the grass might possibly be too long to suit them, and wet rank growth has a tendency to produce foot scald. The lambs should not be suffering from parasitic infection, for which drenching with bluestone and nicotine is necessary, and I recommend putting them on the shortest feed available and giving them access to lick mentioned above.

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Bad Cough in Pigs

W. W. (HUKERENUI):—

I would be very pleased if you could advise me about my pigs, which seem to have a very bad cough. These pigs have had a very bad winter, a lot dying before I took over. There have been no further losses since I took over, and I have been feeding them on meat-meal in conjunction with what grass they graze. They have a good warm shed to sleep in, and two or three are picking up and making good headway but the others have this cough, and they seem to have spasms—just as they start to run for their food, and lasting quite a while, with a discharge of saliva. Would you advise attempting to cure this malady, or would it be cheaper in the long run to destroy them?

I would also be very pleased if you would advise me through your "Journal" as to which is the best way to ring a pig to prevent it from rooting. I heard it was not advisable to put the ring through the centre of the snout as most farmers do. Please explain why.

LIVESTOCK DIVISION:—

From your description there is very little doubt that your young pigs are affected with pleurisy brought on through neglect and exposure of the pigs by the previous occupier of the property. Pleurisy is an inflammation of the membrane covering the lungs and lining the chest wall, and frequently results in adhesions of the lungs to the chest wall. In this state any excessive exercise, such as running to the trough, would bring on spasms of coughing similar to that described by you.

The best treatment for the condition consists of good warm, dry housing, free from draught, and good feeding. It is suggested that you give the pigs a further trial on your present system of feeding and management, as apparently a few have partly recovered. With the extra feeding and care, it is considered a few more will probably respond to this treatment. The remaining animals require to be dealt with on their condition at the end of the further period of trial. No doubt a few animals will be so seriously affected that it will not be an economic proposition to nurse them and carry them on to killing weights.

Putting rings in the snouts of pigs to prevent them rooting is quite important. There is definitely a right method and a wrong method. The ring may be placed on the upper rim of the snout at either side of the middle line, or it may be inserted in a manner similar to that used when ringing a bull, using the fleshy septum between the two nostrils. While in the past many owners have inserted rings in the upper rim of the snout, quite a few have recently adopted the practice of using the ring in the space between the nostrils.

It is necessary to use rings of the right size for the pigs being dealt with. There is a tendency to use a large ring on small pigs with a view to allowing for the growth of the snout. If this practice is followed and a large ring is inserted in the centre of the snout, either in the upper rim or between the nostrils, the ring penetrates too deeply into the nose and either touches sensitive nerves or injures the cartilage of the nose to such an extent that the affected pig is afraid to go to the trough to feed in case of injury to the nose. Many such animals have been seen, and when the offending ring has been removed the pig feeds quite normally and does well.

If the rings are placed at each side of the middle of the upper rim of the snout, the nerves and cartilage are not injured. In the case of a ring being inserted between the nostrils, it is important to use the proper size of ring to prevented it being inserted too deeply.

"Pink-eye" in Sheep

R.S.L. (MANGAMAHU):—

Every year in January and February I am troubled with quite a number of sheep going blind. This year there seems to be more than usual. They develop a milky film over their eyes and are totally blind for a time, though probably most of them recover eventually. They are pastured on good second-class hill country inland from Wanganui. Could you give me any information as to cause, prevention, or treatment.

LIVESTOCK DIVISION:—

The condition described is what is known as ophthalmia in sheep. The cause of the condition would appear to be any irritant acting on the eyes of sheep whereby an inflammation of the eye is set up. The inflammation is first noticed as a congestion of the white membrane of the eye, sometimes referred to as "pink-eye," with a discharge from the corner of the eye. This is later followed by the formation of a film, greyish or whitish in colour, over the anterior surface of the eye itself. The casual irritant may be dust from the road in the case of travelling sheep, dust from top-dressing in windy weather when sheep are left in a paddock at the time the top-dressing is being applied, irritation of the eyes from seed-heads of grasses, or an irritation from any other cause whatever.

Once the condition has been set up in sheep it is inclined to spread rapidly through the flock. The first essential, therefore, in regard to the prevention of spread is to isolate the affected sheep from the non-affected group. The latter should be inspected at frequent intervals, and any cases showing up should be removed and placed in the affected flock. Strict isolation will prevent the spread if the cause of the irritation is determined and remedied. If, for instance, the sheep are running on pasture which has been allowed to get away and contains seeded grasses, a change to short pasture will frequently prevent new cases cropping up.

The treatment of the affected group includes the grazing of the animals in a level paddock free from creeks, etc., where as little damage as possible may be done to the blind sheep. The eye-lotion recommended to be applied to the affected eyes consists of a solution of zinc sulphate in distilled water. Six grains of zinc sulphate are dissolved in 1 oz of distilled water, and a few drops are applied to the surface of the eye-ball by means of a dropper, such as a fountain-pen filler. A few treatments at daily intervals will effect a cure unless the eyeball has been injured. Where a large number of sheep require to be treated, a small oil-can will be found useful as a distributor for the eye-lotion. The lotion should be stored in a glass container except when required for use.

Another recommended eye-lotion may be prepared by dissolving one tablet (8.75 grains) of perchloride of mercury in 1½ pints of distilled water, This lotion is applied by a dropper, similar to other eye-lotions.

Farm Practice and Management

Contributed by Officers of the Fields Division

Method of Controlling Reseeding Of Sub. Clover

A HITHERTO unrecorded method of dealing with subterranean clover was found on pumice country north of Napier, and is worthy of attention. As is well known, subterranean clover provides for its own replanting whether the farmer wishes it or not. Here is a system by which the farmer can control its reseeding.

The history of the crop of subterranean clover hay shown in the photograph is as follows: It was sown 17 years ago with a grass seed mixture in which a few pounds of subterranean clover especially imported from Australia were included. The paddock remained in pasture until 10 years ago, when the farmer decided to take a crop of turnips. After the first ploughing no subterranean clover was present, but upon reploughing it re-established itself.

A subterranean clover hay crop from clover which was originally sown 17 years ago and repeatedly turned under in subsequent years.

Realising that if he did not vary the depth of ploughing he could have subterranean clover available whenever he required it, the farmer has been farming this particular paddock on these lines. The latest ploughing was in September, and the paddock was sown to soft turnips, which were a good crop. It was not until the turnips were well away that subterranean clover again germinated. The soft turnips and clover were fed off, and the paddock at the time the photograph was taken was closed for hay (November). It is a dense crop of practically pure subterranean clover, 18 inches to 24 inches high. This will be harvested now and the paddock grazed until February, during which time it will be fattening late lambs. In February it will be ploughed again and sown in Algerian oats for winter feed. In the ploughing all the subterranean clover seed will be turned in.

In the following spring the oats will be turned in and a further crop of oats sown. This ploughing will turn up the subterranean clover again, and the resultant crop will be oats and subterranean clover for dairy cows after the dry weather sets in at Christmas.

In the following autumn the paddock will be disc harrowed and ryegrass and white clover seed sown to provide a pasture stand until the farmer requires to crop the paddock again. This programme is practically a repetition of what has been the practice

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over the past ten years, the variation being crops of turnips.

To ensure success with this programme, the ploughing must always be of the same depth and either in spring or autumn.

It was interesting to notice that several acres of this same paddock are at present in artichokes with no subterranean clover showing, although the balance of the paddock is carrying the dense subterranean hay crop. After the artichokes have been lifted, the pasture, after ploughing, will return to subterranean clover.

This programme has much to recommend it to farmers on light land who only have limited areas of flat ground available for cropping.

—R. P. HILL, Fields Instructor, Hastings.

The class of land—East Coast pumice country—on which subterranean clover is still growing.

Answers To Correspondents

Sowing White Mustard

"SUBSCRIBER" (CHRISTCHURCH):—

Please let me know about the time to sow white mustard for digging in for green manure in the autumn or early winter. If sown too early it would run to seed.

FIELDS DIVISION:—

In growing white mustard for green manuring under Canterbury weather conditions, no very definite advice can be given as to the correct time to sow, as the growth is governed by the rainfall. Under reasonably good moisture conditions, white mustard has been sown about March 15 and has been showing signs of flowering and ready to dig down by April 20.

Last season, however, because of lack of rain, some growers who sowed white mustard from January to March in many cases did not get a strike at all. The best thing for you to do is to sow your mustard any time from February till the middle of March if there is sufficient moisture in the soil, and dig down as soon as there is sufficient growth.

Frost on Mangolds

A.C. (AUCKLAND):—

A couple of us have this season put in some mangolds for supplementary feed for cows and pigs in winter. We have been told by a Southerner that it is not generally known that if frost gets on mangolds it creates a poison which has proved fatal to stock. As we get a fairly heavy frost in this district we would appreciate some advice from your officers.

The article on sugar beet in the September issue appealed to me, and for years a leading Auckland seedsman has advocated their use for milch cows. Could the sugar beet be sown in a nursery bed and then transplanted?

FIELDS DIVISION:—

Mangolds will not stand exposure to severe frost, and if frosted they quickly rot after thawing. I have never heard of trouble resulting from the feeding of frosted mangolds, as no farmer would be likely to feed them in this condition. Digestive troubles are quite commonly caused, however, when mangolds are fed to stock in quantity before the roots have properly matured. If freely used in this condition, trouble would be likely to

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result whether the mangolds had been frosted or not.

It is probable that you could transplant the beet from a nursery bed in the same way as is sometimes done with mangolds. It has been claimed, however, that this practice does not produce such a well-shaped root as direct sowing, and also that with certain varieties there is some risk that a proportion of the plants will "bolt" to seed instead of producing properly developed roots.

Water-proofing Jute Cow Covers

L.L.O. (CAMBRIDGE):—

Could you supply me with particulars for a suitable dressing for water-proofing and preserving jute cow covers?

(1.) Would boiled linseed oil and lamp black be satisfactory, and is there any advantage in using the latter?

(2.) Would a mixture of Stockholm tar be any better?

FIELDS DIVISION:—

(1.) The following methods have proved satisfactory:—Dissolve 5oz alum in one gallon of boiling water, and 4oz sugar of lead in one gallon of boiling water. Mix together and stand overnight; then pour off clear liquid and throw away sediment. Soak covers in solution and move about till thoroughly wet; then squeeze (but do not wring) partly dry; repeat the dipping, squeeze out again and dry.

(2.) Paint the stretched-out covers with a mixture of two parts of boiled linseed oil and one part of raw linseed oil well mixed together. This should be well worked into the canvas, which should be hung in a dry airy place until dry. Another light coat can be given if thought necessary.

(3.) Satisfactory results can also be obtained by spraying the canvas with tar and fat mixed together and applied as hot as possible.

It Pays To House Implements

IT has been said—and with a great deal of truth—that the average farm implement rusts away far more rapidly than it wears away. Strange as it may seem, the average farmer will freely spend quite considerable sums on expensive farm machinery, use this equipment for the seasonal work on hand, and then leave it in a state of neglect until required again.

In the accompanying illustration these points are well exemplified. A mower and hayrake were bought for last season's harvesting, and, since then, have stood in a yard, where they have become partly overgrown by weeds. In this instance perhaps the worst feature was that within a few yards a perfectly sound shed was available and empty, while these valuable implements were needlessly exposed to the weather.

Implements are expensive enough in normal times—quite sufficiently so, at any rate, to warrant great care of them being taken. At present, the probability is that they will become more costly, and, perhaps, considerably more difficult to procure. Hence, it is very desirable that every effort should be made to prolong their life, and this can be achieved by housing them more efficiently.

Moreover, housed implements can be checked over during wet weather. Bright surfaces, such as plough mouldboards, disc blades, cultivator tines, etc., can be adequately smeared with old oil, worn parts can be replaced, and any temporary repairs in the past season can be made good with more permanent fittings.

Housing will then serve a twofold purpose by protecting equipment and enabling the farmer to have his implements in first-class working order for the busy season ahead.

—C. WALKER, Instructor in Agriculture, Thames.

Money down the drain. Here is a perfectly good piece of machinery left to rust.

'THE BIRDS ARE SINGING AGAIN'

Word has just been received that Spring Steel, ordered in Nov., 1939 to manufacture 'Bevin' Harrows has just been rolled. We have still a very limited stock on hand, but as there is no certainty when our new stocks will arrive here, we advise you to order NOW in order to avoid any delay to yourself, which would be unavoidable by delayed delivery of the steel which generally happens.

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(P.O. Box 880).

An Effective Rigid Wire Gate

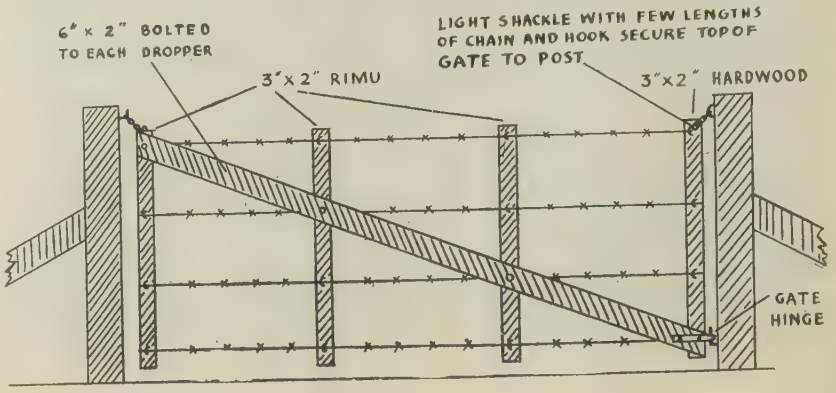
ON a large proportion of farms, particularly dairy farms, the so-called "Taranaki" gate has been freely employed because of its relative cheapness.

While this type has performed useful service, it can at best be regarded merely as a makeshift, and is often the cause of much inconvenience to those employing it.

A modification of this gate embodying those features which result in economy of construction and at the same time providing most of the desirable features of a wooden gate can be seen in the accompanying sketch of a rigid wire gate.

Such a gate is very light, swings freely, and is comparatively cheap to construct.

The dropper at the point of suspension should be of hardwood for preference, as the softer New Zealand timbers do not stand the strains so well. Other droppers may be of rimu


6" x 2" BOLTED TO EACH DROPPER
LIGHT SHACKLE WITH FEW LENGTHS OF CHAIN AND HOOK SECURE TOP OF GATE TO POST
3"x2" RIMU
3"x2" HARDWOOD
GATE HINGE

or other timber on hand. The brace requires to be 6 in. x 2 in. to stand up to stock. Lighter braces in 3 in. x 2 in. and 4 in. x 2 in., while carrying the gate weight satisfactorily, will not prevent damage by bulls and other stock. As shown in the sketch, each dropper should be bolted to the brace.

An ordinary gate hinge can be used at the bottom, while the top can be secured by inserting a shackle in the top of the hardwood dropper and fastening this to the gate post by a few links of chain and a hook inserted in the post. The gate fastener at the other end may be of any type commonly in use.

—C. WALKER, Instructor in Agriculture, Thames.

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The Orchard and Vineyard

Contributed by the Horticulture Division

Orchard Notes

Importance of Observing Trees

MUCH has been written in the past on the picking, grading and preparation of fruit in readiness for the market. Many growers have possibly gathered something from the advice given, while others have learned by observation and experience, but unfortunately, there are some who evidently have failed to grasp some of the essentials.

In business, window dressing has become quite an art, and this doubtless attracts buyers. As fruit is a perishable article and is very susceptible to damage in many ways, every care should be taken if prices are to be maintained and consumption increased. One well-known authority makes the following statement:

"It seems to be ordinarily considered that any fruit sound enough to reach its destination is good enough to be called first grade, but such is a grievous error. The fruit should not only reach its destination in approximately the same condition in which it leaves the orchard, but it should also be attractive and uniform in quality and capable of being held for some time when it reaches the wholesaler and retailer."

It may be as well to define first-class fruit as a sufficient quantity to pack a standard case that is well packed and in which the specimens are all uniform in size, shape, and degree of ripeness, free from bruises, insect and fungus blemishes, and are characteristic of the variety.

Quality of Fruit

This time of the year affords a wonderful opportunity for growers to take note of the quality and quantity of fruit being produced by the respective trees, and the importance of doing this cannot be overestimated if improvements are to be made.

Too many trees are to be seen which once produced good quality fruit and which are now bearing fruit very much below par. This could be obviated by attention to the following points:—

(1) Excess russet, malformed, small fruit, and weak foliage. This may be caused because of persistently following a wrong course in pruning, or by the use of incorrect manures, or insufficient thinning out of the fruit when a heavy setting has taken place.

(2) Crowded fruit spurs, weak fruit buds. These are both inclined to produce undersized fruit inferior in quality, tasteless, and unattractive.

If some such observations are not made and recorded it will not be possible to have defects rectified. The time may not be far distant when only specialised persons will be able to carry on the all-important work of fruit production. The time of slipshod or careless methods is fast passing away; therefore, all true lovers of horticultural pursuits should take every opportunity to improve not only the quantity of fruit produced but also the quality. If quality cannot be combined with quantity, then it is much better to sacrifice quantity and concentrate on quality. The moral is: Keep the trees healthy, manure them well, cultivate sufficiently. Plant them in soils and situations where they will thrive.

Take notice of the following:—

(a) Advice is free at all times.

(b) Get advice before you get into difficulties.

(c) If you get into difficulties, seek advice, and when you get the advice do not be disappointed if it is not in keeping with your preconceived ideas.

(d) If the Departmental officer consulted is not immediately in possession of the information you require, he will get it for you if at all possible.

Fruit Inspection

At the present time some anxiety may be felt by some fruitgrowers when submitting fruit for inspection at the assembly depot. Do not get angry if your fruit is rejected for any packing defects or if it is not up to grading standards. Fruit is never rejected without adequate reasons. If you have fruit rejected, call on the Fruit Inspector and talk matters over with him, and he will help you to rectify any mistakes you have made. There is an old saying, "A person who never made a mistake never made anything."

Seasonal Notes

Spraying is practically finished for the season. See that the outfit is left in such a condition that it will be ready for next season's operations.

While harvesting mid-season and late varieties of apples and pears, the weather may break and unsettled conditions will make harvesting operations difficult; therefore, try and keep picking operations well in hand.

Growers are reminded once more that if the best trees are desired for the extension of orchards or new plantings, they should be ordered in good time. The most satisfactory way is to order a year in advance. By doing this not only are supplies assured, but directions can be given to nurserymen in reference to the manner in which the trees are to be grown.

For commercial fruitgrowing it is advisable to plant only a few varieties. After studying some of the orchards one is forced to the conclusion that too many varieties are grown. Varieties differ so much in different localities that it is not possible to recommend a list that would be applicable to all New Zealand. The handling of fairly large lines of any variety of fruit is

more economical than handling small lines of a multitude of varieties.

The following points should be considered:—

(1) Plant varieties in order to spread the work of harvesting over as long a period as possible.

(2) Select those varieties which show vigour and cropping capabilities combined with flavour and quality.

(3) Plant out not only dessert but some good culinary varieties.

(4) Finally, remember that fruit is required throughout the 12 months; therefore, do not neglect some of the very earliest as well as some of the latest in order to meet the requirements of the consuming public.

—L. PAYNTER, District Supervisor, Auckland.

Citrus Notes

Mr. Smith Tells Mr. Greig About His New Citrus Orchard

"SO you've bought a citrus orchard, Mr. Smith. What's on it, and how is the place looking?"

"To tell you the truth, Mr. Greig, it's not the best, but the property was up for sale cheap, as the previous owner had died, and it seemed to meet my requirements. Here's my orchard registration card filled in—100 lemon trees, 50 N.Z. grapefruit and 20 sweet orange—two acres in all. There is also another two acres which can be broken in and three acres in grass. Will it be too much trouble if I call in once a month until I get the general run of things?"

"Not at all, Mr Smith. I'll call out at your place as soon as possible and get an idea of conditions for myself, but in the meantime let's see what are the main problems. The lemon trees, you say, are about 12 years old but haven't had the best attention, the N.Z. grapefruit seven years, and the sweet oranges about the same. Oh, I see you put your N.Z. grapefruit down under grapefruit on your card. I'll change that to the place labelled Poorman orange. The alteration is quite interesting. All these trees were originally known as poorman oranges, raised from budwood off trees on Kawau Island. Later, an effort was made

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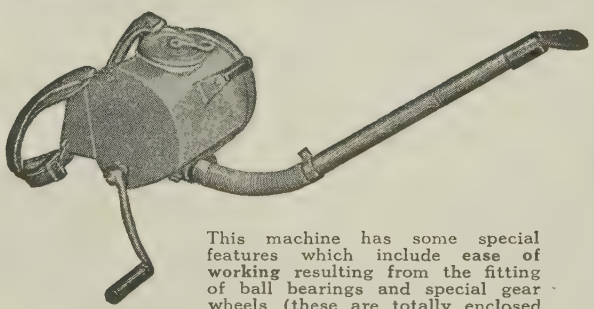

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It is fitted with a flexible metal tube which allows of the lance being directed either in the air or towards the ground for the treatment of trees or ground crops. It is supplied either with one outlet (for fruit trees, bushes, etc.) or two outlets (for dusting 2 rows of ground crops). Depending upon weather conditions, a height up to 25 feet from the ground can be dusted. The output of powder can be regulated.

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to popularise the fruit as Kawau oranges or as grapefruit. However, all are still classified on the registration card as Poorman oranges and only the finer strains of well-matured fruits picked in August, September, or later should be called N.Z. grapefruit. Grading regulations have been issued, but we'll discuss that later when you are picking.

"Let's take the lemons first. As you are aware, all lemons for sale must be sent in to the Internal Marketing Division's nearest depot. These depots are at Kerikeri, Auckland, Tauranga, Gisborne and Hastings. As you'll probably hear the marketing of lemons discussed by your fellow growers, I'll try and give you an idea of the basis on which payment is made today. Growers forward their fruit in cases of varying sizes and fruit of mixed quality.

"The first thing to remember is to have your cases in sound condition and free from nails, which might injure the fruit. The fruit should be carefully clipped from the trees and placed in the cases. Make sure that all fruits are cut clean up to the "button" or they will have a jagged point as dangerous as a nail. Discard at the orchard all diseased fruits. The diseases you will most likely see are a scab known as citrus-verrucosis and a scale, citrus red-scale, a sucking insect just larger than a pin head. All such infected fruits should be buried at the orchard, as they'll only be rejected at the lemon depot.

"When the fruit arrives it is graded by certain standards of quality into measure cases. These are equal to a bushel of jumbled fruit filled to the top. On the assumption that it takes 1½ of these loose bushels to pack a bushel—there is a pack down of one-third or 33 1-3 per cent.—the price paid on the average for marketable grades in 1940 was 4s. 8d. per loose bushel and 7s. for the quantity of fruit which would cure and pack a bushel. The marketable grades are Fancy and Commercial, with Minimum as an extra —the 4s. 8d. was then divided up to 5s as a basic average for Fancy and 4s. 4d. for Commercial.

"You will notice, however, that although lemon trees bear all the year round, there is a period of maximum and a period of minimum fruitfulness. There is no difficulty in selling all local lemons during the months of short supply, so the price per grade is increased at that time. In 1940 it rose to 6s. 2d. for Fancy and 5s. 2d. for Commercial from mid-February to mid-March. On the other hand, the price is lowered at the time of plentiful supply, and at that period, August-September, the price for peel is as good as that for Commercial grade. Peel prices and juice are by the pound, 1¼d. per lb. for 1st peel, 1d. per lb. for 2nd peel, and ½d. per lb. for juice. To obtain the best results a grower must get as much fruit sent in from January to April as possible and of as high a quality as possible. This can be done by regular picking and pruning.

"From this you see that a grower's price received each month depends upon the pool period and the ratio between the higher and the lower grades. So your first job is to pick all you can at once. First pick off all coloured fruit whatever the size and then as many light or silver-green fruits of 2¼ inches up to 2½ inches. When fruit approaches 2¾ ins. you should let it get fully coloured for peel. Don't forget the proper clipping and to discard any diseased fruit at the orchard.

"Now for this next month:

(1) Pick your lemons.

(2) Put on your oil spray—3 per cent. certified summer oil.

(3) Clean around your lemon trees lightly with a spade, shovel or hoe, but avoid cutting roots if they are near the surface.

(4) Prune off with a special pruning saw any dying or dead branches and burn.

(5) Order some manure for the trees, to be applied next month. Dried blood, fish manure or blood and bone are a good choice. Your lemons will need about 10 lb. per tree and your other citrus about 5 lb."

"Oh, Mr. Greig, before I forget, some of the lemon trees look sooty and I can rub the film off with my finger."

"I'm glad you mentioned that, as this is the best time to get rid of that sooty appearance. You have heard me mention oil sprays several times. The cure for that sootiness is an oil spray. The so-called soot is really a fungus growing on the honey dew excreted by scale insects. An oil spray blocks the breathing pores of these scale insects. The two which generally cause this sooty mould are the wax scales and the olive scale. The hard wax scale seems to be on the move this year, and has been found on other trees than citrus. The young are white and star-shaped, and now is the time to deal with them. Before hatching, they are protected by the mother scale and an oil spray cannot get at them. Once the young have hatched they appear all over the leaves, especially down the veins. If this scale were the only one a 1½ per cent. certified oil would be sufficient, but as citrus red-scale is generally also present, 3 per cent. is recommended."

"What do you mean by certified, Mr. Greig?"

"That means certified by the Plant Diseases Division that the oil spray is up to the purity standard required and if applied as directed no harmful effects will occur. You may choose any of the certified summer oils to use on your citrus trees. When mixing be sure your oil is thoroughly emulsified. Put the quantity of oil into the container and add a little water, stir to an emulsion and then slowly add the rest of the water, stirring continuously."

"Thank you, Mr. Greig, I'll start off on the lines you have suggested and call in again next month."

—A. M. W. GREIG, Citriculturist, Auckland

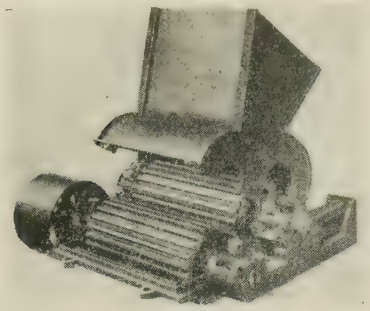
Viticulture

Points in Making Cider

THE practice of filtering fresh apple juice before fermentation is not advisable. The mucilaginous and albuminous nature of the solids clogs the filtering material very rapidly, and renders the process very slow even under heavy pressure. It is, moreover, very doubtful whether apple juice from which these substances, containing some of the food of the ferments, are extracted would produce a cider which would justify the extra cost and trouble. Filtration should be reserved for treating ciders which have not cleared naturally or after successive rackings, and when they are otherwise ready for bottling.

Fermentation

The juice can be left in an open vat to ferment for a few days until a crust forms on the surface of the liquid and a thick deposit, known as



A large power type of pomace crusher.

"lees" forms on the bottom of the vat. The crust is then skimmed off and the clear juice is run off the lees into the fermenting barrels or vats. Many advantages are claimed for "keeving," as this process is called, the principal of which is that it rids the juice of undesirable solids. The principal objections to it are the cost of double handling and the extra vat required.

As the surface of the liquid is exposed to the air, there is also more risk of contamination from vinegar bacteria, the bugbear of cider-makers. In addition to those which may enter from outside, there are always a few of these organisms in the juice waiting for favourable conditions to increase. Exposure to the air furnishes these conditions, and for this reason the greatest care should be taken throughout the whole process of cider-making to avoid all unnecessary contact of the cider with the air.

A more rational method for the production of a high-class cider is to obtain the juice as clear as possible from the press and run it directly into barrels or closed vats, filling them to the bung-hole. Fermentation will start spontaneously, and will generally be observed after two or three days, or it may take longer in the case of the first barrel or if the weather is very cold. In the barrels or vats which have been filled up, and in which fermentation has begun, the froth will begin to ooze out of the bung-holes. These barrels should be placed a little on one side to allow the froth to run down one side only of the barrel into a basin, or a trough, if there are several barrels, placed underneath. These barrels or vats should be kept filled up, and the froth wiped away daily from the sides, and the basins emptied and cleaned, or the troughs swilled down with lime-water.

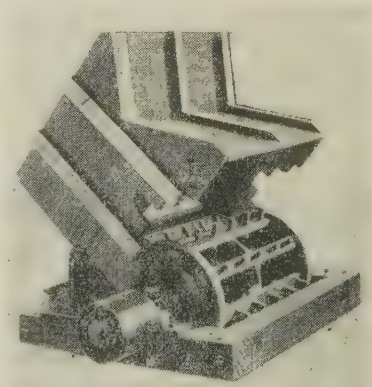
The froth forms a crust on the surface, and sinks into the liquid when the first tumultuous stage of fermentation subsides. At this period the containing-vessel should be filled with similar juice from another barrel or with cider from a previous brewing, or, failing both, with clean water.

By both of the foregoing methods a good cider can be produced, provided the utmost cleanliness is observed and the barrels or vats are absolutely sweet and clean and free from vinegar and mouldy flavours when they are filled.

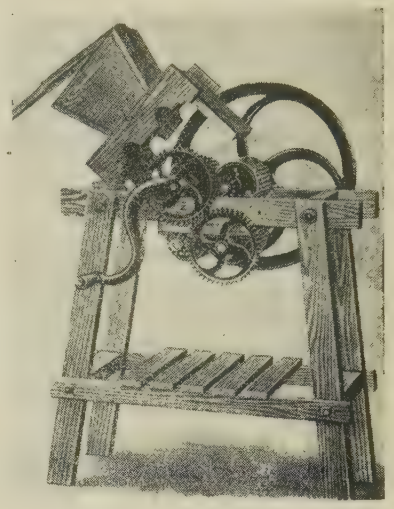
Where there is a choice of location for fermentation the coolest one should be preferred, as, all other conditions being equal, the finest cider is produced by a slow fermentation at a low temperature. The ideal condition would be a uniform temperature of 45 degrees Fahrenheit—a condition which can be obtained only by artificial means, and the cost of which would be prohibitive to producers of small quantities.

Another most important condition both during and after fermentation is the exclusion of air from the surface of the cider, and as long as this is done there will be little danger of acetification. A sufficient amount of carbon dioxide gas, which is heavier than air, can be retained on the surface of the fermenting liquid by placing a small bag of clean sand, about 6in square, over the bung-hole. Another method is an air-trap made by fixing a V-shaped piece of glass tubing, having the arms about 6in long, into a hole in the bung. The bung is then fixed tightly in the barrel, and the free arm of the tube placed in a glass of water on the barrel. While fermentation continues the surplus gas will escape, causing bubbles to rise in the water, and the air will thus be excluded. The rapidity with which the bubbles rise will give a good idea of the process of fermentation, and a cessation will indicate that the action of the ferments has ceased and that a dry cider has been produced.

No exact period for complete fermentation can be given because of many factors, such as the composition of the must and the temperature of the fermenting-room, etc. The use of pure yeast ferments is to be recommended, but as the propagation and use of these yeasts requires a considerable knowledge and great care, it is not



A power type of pomace picker.



A type of hand grater.

intended to deal with the subject here. The wild yeasts naturally available from the apples themselves has proved eminently satisfactory in New Zealand, provided cleanliness and reasonable care in excluding air are observed.

Racking

The object of racking the cider is to separate the clear liquid from the lees or deposit formed in the bottom of the barrel. At least two rackings should be made before bottling the cider—the first one when the tumultuous phase of fermentation is over and the cider is fairly clear, and the second before the density is reduced by fermentation below 2 degrees Baume, or before bottling if it is intended to bottle at a higher density. It is advisable to rack at about a half a degree above the degree at which it is intended to bottle in order to allow for further fermentation between the time of racking and bottling. Supplementary rackings can be employed for clearing the cider and for slowing down and prolonging the fermentation.

A cold, bright day should be chosen for racking. The simplest way to operate is by gravitation, running the cider into a lower cask through a rubber tube used as a siphon. A small cup should be so fixed at the suction end of the tube that the suction will not cause the lees to rise, and the tube then attached to a stick or cane so that when the stick is introduced into the barrel and the end of the stick is resting on the bottom the tube will be well above the lees. When the barrel is nearly empty the tube can be gradually lowered until the liquid becomes cloudy. A section of glass tubing inserted in the rubber tube and a light placed behind it if necessary would greatly facilitate operations.

—B. W. LINDEMAN, *Vine and Wine Instructor, Auckland.*

(To be continued.)

Cool Storage Notes

Stacking Fruit for Shed Storage

THE stacking of cases of fruit temporarily in shed storage during the coming fruit season will be necessary in order to regulate market supplies. To obtain the best use of the available shed storage and avoid rapid deterioration of the fruit, the method of stacking and dunnaging the fruit cases should be closely studied. Air movement around each case of fruit is essential in order to delay the colouring and maturing processes, particularly the fruit in the cases which are placed near the centre of the stacks.

Dunnaging

Dunnage should always be carefully placed as near to the ends of fruit cases as possible. It should be placed on a stack of cases so as to run the same way as the timber forming the ends of the cases. This method will assist in obtaining stability of the stacks, and will also prevent bruising of the fruit from the pressure of the dunnage on the timber forming the sides of the cases.

Method of Stacking

The method of stacking the fruit cases will be influenced mostly by striving to obtain full use of the natural air movement in the shed in which the fruit is to be stacked. The dunnage placed on the floor of the shed should not be smaller than 2in. x 2in., and one of these should be placed under each end of each case (as shown in Fig. 1). If the fruit is to be held for longer than 21 days, then 1in. x 1in. dunnage should also be placed on the first three cases in the stack, and 2in. x 2in. should be placed on each fourth case. These directions should be repeated as the height of the stack is increased, taking care to leave at least two inches space between the ends of the cases in the stack. The blocks of cases should have at least an eight-inch space between each six rows of cases. This should apply when stacking the fruit cases either side- or end-on to a central passageway.

When stacking cases of fruit, walking boards should be placed on the cases to prevent bruising of the fruit should it be necessary to walk on the thin timber of the cases. This practice should also be followed when stacking fruit in a wharf or railway shed. The dunnage should be cut to the following dimensions:—7ft. lengths of 2in. x 2in. and 1in. x 1in.

Stacking Unwrapped Fruit

The accompanying illustration (Fig. 2) illustrates a reliable method of stacking cases of fruit in ordinary storage sheds. When fruit is stored unwrapped, lids should not be placed on the cases. When stacking the cases of fruit a 2in. space should be left between the ends of the cases in each row. When "staggering" each case, leave a two-inch space between the cases; this allows for air movement throughout the fruit stacks. Louvres should be provided in the walls of orchard storage sheds near the ceiling for ventilating and cooling purposes. A central passageway should be left when stacking the fruit to facilitate inspection. A door of ample proportions should be provided in the storage shed at each end of the passage to assist ventilation.

—A. POWELL, Cool Storage Officer, Wellington.

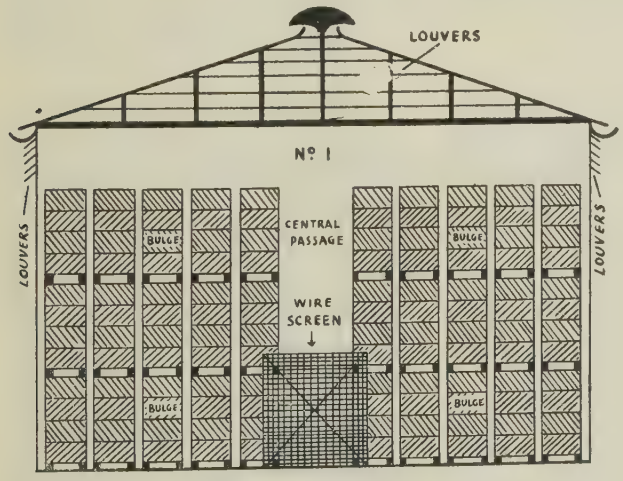


Fig. 1.—A sectional view of the shed, showing the method of stacking packed fruit for temporary storage. Wire screens should be placed across the door openings at both ends of the shed to assist ventilation. Method of stacking:—6 inches of clear space between the inside of the studs and the stacked fruit; 2 inches clear space between the ends of the cases; 2 in. x 2 in. dunnage on each fourth case, and also 1 in. x 1 in. between each case if the stack is to remain for longer than 21 days.

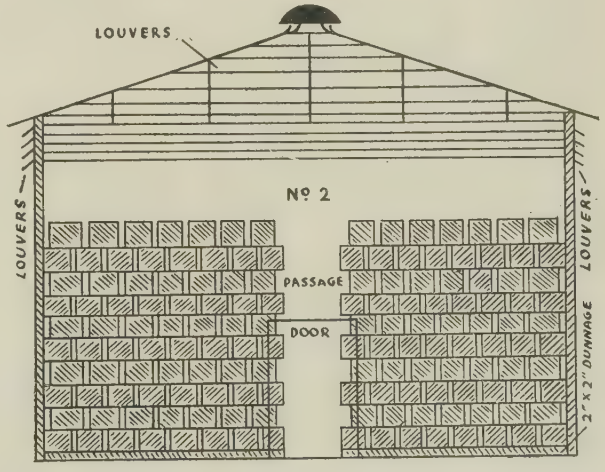


Fig. 2.—A sectional view of an ordinary storage shed, showing the method of stacking the fruit in orchard boxes without lids. Details:—2 in. x 2 in. dunnage is used on the floor only; 2 inches of space should be left between each case, and 2 inches between each row of cases.

The Home Garden

Vegetables, Small Fruits and Flowers

Growing Spring Cabbage For Spring Cutting

IF a continuity of cabbage for the home garden is desired, provision must be made now.

A small piece of land in a sunny part of the garden should be selected and, after digging, should be worked to a very fine tilth and prepared for a small seed bed. A seedling box, which can be easily handled (and will economise the garden space) is better for raising a small number of plants. The box should be filled level with the sides with soil which has been passed through a ¼in. sieve, or which has been finely powered with the hands, and mixed with a quarter of its own bulk of coarse sand. If available, compost is preferable.

The soil in the box should be well rammed with the fingers of both hands, particularly round the sides and at the corners. During subsequent watering operations this will prevent the soil from falling away from the roots of the young plants. After the surplus soil has been removed from the box the remainder should be gently but firmly pressed down with a piece of dressed timber, 7in. or 8in. long by 4in. by 2in.

Sowing the Seed

Then take a piece of 3-8in timber, long enough to be almost equal to the breadth of the seedling box, and use this to make furrows 2in. apart and 3-8in. deep. Into this sow the seed thinly, and with the piece of timber used to make the furrows, press the seed gently down and cover with some of the soil left over from filling the box, repeating the pressing down of the soil—gently—with the dressed piece of timber previously mentioned.

It will be necessary to cover the box with a double sheet of newspaper, which should be supported on narrow pieces of timber placed to provide ventilation and prevent the paper resting on the soil. As soon as the seed begins to germinate the paper should be removed, preferably at night, in order to allow the young plants to become a little hardened off before being subjected to the heat of the day. If the soil should become dry, water by soaking the whole box in a tub or other convenient vessel, allowing sufficient depth of water to reach three-quarters up the box. By capillary attraction the whole of the soil in the box will get properly moistened. This also applies when the plants are very young.

Protecting the Seedlings

When the young plants have grown to the height of ½in. they will require to be protected from insect attacks. This is best done by spraying with nicotine sulphate as directed on the container or with arsenate of lead powder ¼ per cent. to ¾ gallon of water.

Transplanting

When the young plants have produced their first four leaves, they can be transplanted to the garden to develop until it is time to plant them in their permanent position. If, however, a seedling box 6in. deep is used, the young seedlings can be grown without transplanting; thinning out is all that will be necessary, but the spraying must be continued, not less than once a week, but preferably twice.

The variety of cabbage of outstanding merit for use from Taranaki south is "Sutton's Flower of Spring," but further north a variety of "Henderson's Succession" is grown.

Planting and cultural directions will follow in the April issue of the "Journal."

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Seasonal Don'ts

Don't

distribute lime over the surface of the ground before digging or trenching. It should be applied as a surface dressing after the ground has been dug. It soon washes into the ground, where it is required, and if it is buried the surface layers of soil do not receive any benefit from the application.

Don't

apply lime each time the ground is dug. It is not necessary. An application of lime every three or four years is generally sufficient. It should then be applied as a generous application, and, if ground limestone is used, ½ to 1 lb. to the square yard (1 to 2 tons per acre) is not an excessive dressing. Crops which show definite response to lime should be grown after the application has been made. Such crops are those belonging to the cabbage family.

Harvesting Kumaras

THE digging of kumaras should be delayed as long as possible so that maximum development of the tubers may be made. It should, however, be completed before frosts occur. In the event of an unseasonable frost sufficient to kill the tops, these should be removed promptly to prevent rots penetrating from the injured stems to the tubers. Digging should then be completed as soon as possible.

The tops are first removed, the ridges are exposed, and digging may then be continued. The tubers bruise very readily, and every care must be taken not to injure them. They should be handled as carefully as eggs or fruit. Any that are bruised or cut should be put on one side for immediate use, as they do not keep well. The tubers should be removed from the roots, leaving as small a broken surface as possible.

After digging, the tubers should be left on the ground for several days

What to Do in the Home Garden Next Month

Summary of Operations During April

VEGETABLE SECTION.

Successional Sowings.—Nil.

Other Sowings.—Onions (before the middle of the month).

SEEDLINGS TO TRANSPLANT.

Silver beet, spring cabbage (till the middle of the month), endive, cauliflower.

PERENNIAL CROPS.

As soon as the growth on asparagus plantations shows a yellow colouration it should be cut. If seed is present the material should be removed and burnt.

Break up chives and replant them in rich soil.

In warm districts perennial herbs may be broken up and replanted, or cuttings taken.

CROPS IN SEASON.

Salads.—Corn (Dec.), lettuce (Jan.), endive (Jan.), radish (Mar.), spring onions (Jan.), tomato (Oct.), melons and cucumbers (Oct.), celery (Sept.), capsicums and egg fruit (Aug.-Sept.).

Greens.—Beans (Jan.), marrows (Oct.-Nov.), peas (successional early dwarfs), New Zealand spinach (Oct.), winter cabbage (Oct.), savoy (Oct.), Brussels sprouts (Sept.).

Roots.—Beetroot (Sept., main crop), carrots (Nov.-Dec., shorthorn and main crop), parsnip (Sept.), salsify (Oct.), pumpkin (Oct.-Nov.), swedes (Nov.), kumara (leave in the ground as long as possible), artichokes (Sept., dig as required).

CROPS IN STORE.

Beetroot (main crop), onions, shallots, potato onions (for seed purposes only), potatoes, pumpkins.

GENERAL WORK.

Dig or trench any ground that is free of crops. If not required for further planting, sow down to a cover crop. Where, however, the ground is heavy it may be better to leave it exposed to the winter weather.

Earth up leeks and celery.

Keep the hoe and cultivator moving among crops. The cultivation may be deep with newly-planted crops, but should be shallow when crops are approaching maturity.

SMALL FRUITS SECTION.

Prepare ground for May planting. If carrying a cover crop, this should be ploughed under.

GLASSHOUSE SECTION.

See last month's notes.

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so that the surface may dry out completely. During this period they are liable to attack by rats, birds, or insects. If this occurs it is a good policy to stack them in the field and to cover them at night or during wet weather with their tops.

Storage

When the tubers have undergone the preliminary sweating, usually taking about a week, they should be taken to the store. The essential conditions of the store are that it be cool (but not cold), dry and free of draughts, and vermin-proof. A shed, or a pit dug into dry ground, is quite suitable. In small quantities the tubers may be embedded in dry sawdust or sand in boxes or bins. In larger quantities they should be stacked on a foundation of straw or fern and protected from attacks by vermin. Under such conditions they will keep for many months.

—F. SYDENHAM, Assistant Horticulturist (on Active Service).

Maintaining Soil Fertility

IN the highly specialised cropping of gardens any reduction in the supply of fertilisers in addition to a shortage of organic manures creates a position which requires careful attention, more especially as regards the supply of potash, which soon becomes seriously depleted with the total removal of crops over a long period. Potash is a necessity for cropping light, sandy or peaty coastal soils, and the supply under present conditions is best obtained as far as possible in the form of seaweed.

In a wet state carted seaweed contains about 1 per cent. potash, but when dry the percentage rises to 5 per cent. to 10 per cent., according to the kind of weed. In a general way, seaweed is comparable with farm manure, although it is rather poorer in nitrogen, much richer in potash, poorer in phosphates, and has a high proportion of common salt. Collected in the autumn and composted with farm manure and other organic material, it will decay, and, after turning and mixing, be in good condition for application to the land in spring at a rate of about 10 tons to the acre (5 lb. per square yard). Where large quantities of seaweed are available, it can be applied to the land in autumn as soon as it is vacant in liberal quantities of 20 tons or more per acre and turned under. Dried and sheltered from the rain, it will keep without deterioration, and be available for application later in the season in concentrated form.

When cropping land at a distance from the coast the labour and cost of cartage heavily discounts the value of a bulky manure such as seaweed. Apart from what animal manures may be available, green cover crops have chiefly to be relied upon, and the potash requirement may be supplemented with wood ash. Root crops, legumes, and fruiting plants generally have a partiality for potash, and where high feeding with nitrogen is to be done it will be most successful when balanced off with that mineral.

Wood ashes from ordinary hedge clippings contain about 11 per cent. potash, common broom 33 per cent., gorse 28 per cent., and ordinary sawmill wood ash 5.88 per cent. potassium oxide—real potash. Half a ton (10 cwt.) of sawmill wood ash will contain potash equal in quantity to that in 1 cwt. of sulphate of potash. It will also contain those "minor elements," the lack of which is causing serious losses in crops of many kinds. Further, it will contain a considerable quantity of lime, and also magnesia, manganese, and phosphoric acid.

In plants, the greatest amount of nutriment, including potash, is contained in the young growth, and not in the woody portions. Hence the richness of young grass, prunings, and trimmings from hedges, etc. In the mineral ash remaining when wood is quite consumed the potash in the form of a carbonate readily absorbs moisture and quickly runs away. The leached ash will contain most of the other minerals, but to preserve the potash wood ashes must be stored in a dry place before leaching takes place.

—WM. C. HYDE, Horticulturist, Wellington.

APIARY NOTES

Contributed by Officers of the Horticulture Division

The Autumn Apiary and Honey-house

WHEN bees are gathering nectar in abundance they will make no attempt to rob, but during a season when there is a scarcity of nectar in the fields they will take every opportunity to secure honey or any sweet substance not protected from them. Robbing starts very easily in an apiary at this time of the year when the flow of nectar has ceased, and once started it is extremely difficult to control.

Hives should not be kept open any longer than is absolutely necessary for the removal of the surplus crop of honey, and all supers taken from the hives should be covered and quickly removed to the honey-house away from all flying bees.

Wet Combs

No attempt should be made at this time of the year to place wet combs back on the hives for cleaning up purposes during the daytime. This work should be left until the late evening and completed as quietly and quickly as possible to prevent any undue disturbance of the bees.

The sudden cessation of the nectar flow in the early autumn when the colonies are still strong leaves a large force of field bees with no work to do; consequently any undue disturbance of the hives at this time will cause the bees to become vicious and troublesome to the beekeeper. Until the surplus field bees die off they will quickly attack and rob any weak or unprotected colonies. Queenless colonies fall easy victims to robber bees in the autumn, and care should be taken to unite them, and also to unite all weak colonies to strong queen-right colonies in the apiary.

Uniting Colonies

The uniting of colonies is most readily accomplished in the evening, when all field bees have returned to the hives. After taking the roof and mat from the queen-right colony, place a sheet of newspaper immediately over the top of the frames and carefully place the queenless colony on top.

Little or no smoke will be required if the hives are handled gently. Any weak colony with a poor or failing queen should be united in the same manner after the removal of the queen.

Winter Stores

The dependable sources of nectar in the spring must be taken into account when deciding how much honey is required for winter stores. To bring colonies of bees through in good shape from clover flow to clover flow in plains districts in parts of New Zealand requires a good deal more honey per hive than is the case in areas where early spring sources can be depended upon, such as native flora and manuka scrub. The problem in these areas is to keep the bees from becoming strong too early in the season.

In all other districts it is a good plan to leave at least 40 lb of honey (eight well-filled, full-depth combs) on each hive at the close of the season for use by the bees until sufficient nectar is available from the fields to support the colony and allow a normal rate of brood-rearing the following season. Beekeepers should realise that the foundation for a crop of honey is laid the previous autumn, and should provide the bees with a liberal supply of honey to winter on.

Granulation Of Honey

Attention was drawn in last month's notes to defects in the granulation of New Zealand honeys and how to overcome them. Another problem partly associated with honey packing is frosting or dry granulation in honey. This irregularity usually occurs in the best honeys, and no satisfactory way has yet been found to overcome this condition completely.

Physical examinations made at the Animal Research Station, Wallaceville, and also at the Cawthron Institute, Nelson, indicate that this defect is caused by aeration during packing operations and by contraction during the normal course of granulation. Where honey remains soft, as it does during hot summer months, frosting does not occur; but where the same honey is submitted to low temperatures, granulation becomes more intense, with a consequent change in honey volume, causing air spaces to develop between the container and the sides of the honey.

Froth in Honey

Light-coloured froth found in honey in the form of pockets or fissures is caused by tiny air bubbles, around which frosting develops in the manner described during the normal course of granulation at low temperatures. This condition may develop in less than a month after packing, and although it looks bad, the eating quality of the honey is not impaired provided no further trouble develops from air-bubble contamination.

(*Continued on page 206.*)

PUBLIC SERVICE

APPLICATIONS (to be made on P.S.C. Form 17A, obtainable at principal post Offices), with copies only of testimonials, will be received up till NOON on the 25th March, 1941, for the position of APIARY INSTRUCTOR, General Division, Department of Agriculture, at a location to be decided. Commencing salary £305 p.a., plus Public Service Bonus, usually £13 per annum.

It is desired that applicants should have had experience in practical beekeeping, and possess a thorough knowledge of foul-brood and other bee diseases and methods of treatment; and should also be capable of writing articles and delivering addresses on the bee-keeping industry generally.

The successful applicant will be required to bear any expense incurred in travelling to take up appointment, which will be subject to the provisions of the various Acts and Regulations affecting the Public Service.

Secretary,
Public Service Commissioner.
WELLINGTON, C.1.

Notes for the Poultry Farmer

Contributed by Officers of the Livestock Division

Meeting the Shortage Of Pollard and Bran

By F. C. BOBBY,
Superintendent of Poultry Husbandry, Wellington.

THE fact must be faced that it is impossible at the present time to alter the situation in regard to supplies of pollards and bran. Rather it is wiser to consider what substitutes may be used in the event of a shortage of either or both of these important meals.

The first fact to keep well in mind is that sudden and drastic changes in the laying mash invariably lead to a check in egg production and, on occasion, to a moult. It is safe to include substitutes gradually while supplies of pollards and bran are still availabe but expected to be in short suppy in the near future. Then, should either or both become unobtainable, the changes in the mash need not be so drastic, and losses in egg production will be reduced to a minimum.

Best Substitutes

The best available substitute for pollards are wheat-meal and barley-meal. These differ from pollards in three essentials. which should be noted. From a purely practical angle both meals contain more "floury" material than pollards, and therefore require a greater proportion of bulky material to be added to the mash, usually in the form of bran or a substitute similar in nature. This additional bulky material prevents the mash becoming "sticky" or "tacky" when moistened with water—a condition which makes the mash unpalatable and liable to clog on the beaks of birds eating it.

From a nutritional point of view both wheat-meal and barley-meal contain more starchy material and less protein than is to be found in pollards. Furthermore, pollards contain a higher mineral-content than either of the other two meals. Thus, in making up a mash with these two substitutes it becomes necessary to increase the meat-meal by 1 to 2 per cent. and to add minerals. Unless the protein or meat-meal is increased there will be a tendency for the mash to fatten the birds because of the additional starchy material present. The mineral-content of the mash may be increased by the addition of 2 per cent. steam bone-flour (or meal) or 2 per cent. of a mixture containing half steam bone-flour and half common salt. The latter mixture is of greater value to birds than the pure steam bone-flour, but it is essential that the mixture be well mixed into the mash. It is still more important to see that the **correct amount** of salt is used and that this salt is **not in small lumps.**

Suggested Mashes

The following mashes take into consideration partial and total substitution of pollards:—

No. 1.

1 part pollard 1 part wheat-meal 1-1½ parts bran 7 per cent. meat-meal	by measure.

No. 2.

2 parts wheat-meal 1½-2 parts bran 2 p.c. mineral mixture 8-10 p.c. meat-meal	by measure.

No. 3.

1 part barley-meal 1 part wheat-meal 1½ parts bran 2 p.c. mineral mixture 10 p.c. meat-meal	by measure.

A latitude in the amount of bran recommended is given because of the possible variations in the fineness or otherwise of the grinding of the wheat-meal purchased. Sufficient bran should be included to ensure a satisfactory mash when mixed with water.

In the instance of a shortage of bran the situation becomes more difficult, as there is no substitute directly comparable with bran. It now becomes necessary to make use of lucerne-meal and finely-chopped green food. Note should be taken of the fact that **parts by weight** are given in the mashes including lucerne-meal quoted below:—

No. 4.

60lb. pollards
24lb. bran
10lb. lucerne-meal
6lb. meat-meal

No. 5.

28lb. pollards
28lb. wheat-meal
20lb. bran
15lb. lucerne-meal
9lb. meat-meal

Care must be taken in attempting to use lucerne-meal in proportions greater than 15 per cent., as there is a tendency for the mash to become unpalatable. When bran is unobtainable a mash may be "opened up" or bulked by the use of finely-chopped green food up to a total of about 25 per cent. of the mash. If a change-over to chopped green food in the mash is expected the quantity added to the mash should be increased daily over a period until the total amount required ultimately is reached. No sudden change must be made.

Soaked Grain

Reports to hand indicate that the shortage of pollards and bran is being met satisfactorily in another manner and by the use of soaked grain. The method adopted is to soak wheat or barley in water to which 10 per cent.

meat-meal has been added, endeavouring to use just sufficient water so that it will be absorbed by the grain within 24 hours. The grain must be stirred several times while soaking. This is recommended as a temporary expedient during the summer, as it is unlikely to give satisfactory winter egg production.

When available, milk curds should be used to conserve other forms of food supplies. Leaflets setting out the value and method of using both soaked grain and curds may be obtained on application to the Department of Agriculture.

The mashes Nos. 1 to 5 given in these notes may be supplemented by the usual grain feed, while every effort should be made to supply a daily feed of green food. The latter would not apply where finely-chopped green food is used to bulk the meal.

Finally, a word of warning may be given in connection with hens set aside for breeding purposes. When wheat-meal or barley-meal is given to this class of stock a close watch must be kept to see that these birds do not become overfat. Overfatness leads to incubation losses later, and can be avoided by including extra bran in their mash to offset the fattening effect of the starchy material in the wheat-meal and barley-meal.

Poor and Brittle Egg Shells

Complaints recently received from consumers concerning the brittleness of egg shells call for a reminder to poultrymen about the use of oyster shell. Many birds are concluding a long period of heavy egg production, while the new pullets are entering their first flush of production. Both require an adequate supply of easily assimilated lime for shell formation. This lime can be effectively supplied by placing oyster shell before such birds at all times. Birds in lay readily eat oyster shell, and the supply rapidly disappears. Unless fresh supplies are given at regular intervals trouble may occur. Poor shells cause an increase in cracked and broken eggs, resulting in a loss of money to the producer and an outburst of complaints from both distributor and consumer.

Planning the Erection of New Plants

THE autumn season, and March in particular, is a convenient time to plan the erection of new plants, or further extensions to provide extra accommodation for next season's young stock. Poultrykeepers then have time, apart from the usual routine duties of management, which can be well spent in necessary repairs and extensions or in the erection of new buildings.

When planning the erection of a plant, full consideration should be given to questions affecting the efficient working management of the farm, including the elimination of unnecessary labour, the health of the birds, conditions likely to affect egg production, and the consequent financial return expected from the stock.

Site and Soil Conditions

Local weather conditions will or should determine the type of building to be erected. If the proposed site

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is exposed and without much natural shelter, then the building should be designed to provide within its walls the maximum shelter. Furthermore, when planning a house in an exposed position rather more floor space per bird than is usual should be provided, as they will spend more time if under semi-intensive conditions within the building in order to seek protection from rough weather. Poultry do not like exposed, windy conditions. Exposure to cold winds may affect the health of the stock, and will undoubtedly affect the egg production, with consequent financial loss. The natural sequence, therefore, is to erect the plant with this in view, and to select, if possible, a naturally sheltered position.

Showing the front and side walls of the poultry house described.

Poor sanitary and health conditions are, more often than not, due in some measure to a failure to visualise to the full the effect of local conditions. A dry floor is essential, and even where a poultry house is well constructed this may be difficult to obtain should the house be placed in a damp site. Unless the floor is dry, trouble is generally encountered. Damp floors produce wet litter, the forerunner to most troubles and diseases, including coccidia and parasitic infection of poultry stock. Care is needed, therefore, to select the highest and driest site, possessing, if possible, a natural fall.

Naturally, the question of access to the house will determine to some extent the possibilities of selection. Should the site be damp, much can be done to counter its effect by filling in or building up the ground level to at least 4 in. to 6 in. above the surrounding contour of the land. Shingle, cinders, sand, etc., all provide a good bottom on which to lay concrete floors. Such a floor will provide good dry conditions. Unless the site is particularly dry, a concrete floor set on ground level is liable to dampness, because concrete often draws moisture from underneath.

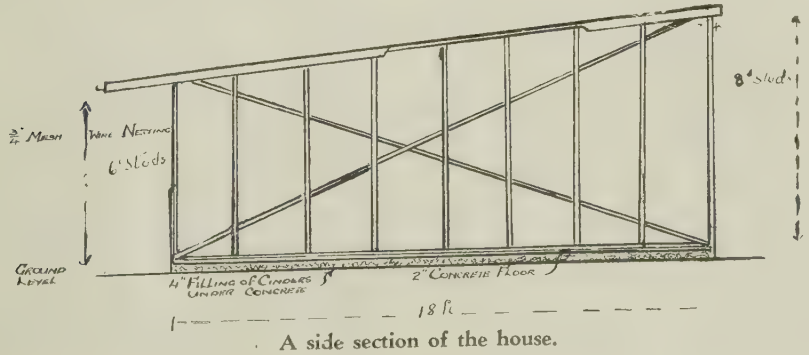
The Floors

Concrete has proved to be a very suitable type of flooring material. It is not necessary to lay heavier than 1½ in. to 2 in. thick according to the quality and size of the shingle. A ratio of from one of cement to six of shingle will be sufficiently strong for the work. A smooth surface should be given to the floor to facilitate cleaning operations, otherwise the crevices or rough surface will not readily clean and will tend to harbour parasitic life and disease organisms. A slight fall towards the front entrance will assist drainage from surface cleaning and scouring work, and after cleansing, the floor will then more readily dry on the surface. A good, hard concrete or substitute floor in these days can almost be considered essential for the efficient handling of the plant. Much labour and dust is eliminated, which all tends towards efficiency.

Bitumen as a substitute has the advantage of being warmer and possessing more resistance to dampness. It has, however, a serious defect, as, should the litter become damp and stick to the floor surface, there is the possibility of the bitumen scaling and leaving a rougher surface. Concrete is to be preferred provided it is well laid and is above ground level.

Ventilation

A good internal ventilation system is essential if one expects to keep a poultry house dry and the litter in a sweet condition. Especially is this the case during damp weather or the winter season when climatic conditions are not favourable. Any system must ensure free ventilation without draught. Taking these points into consideration, together with the cost of construction, a lean-to type of house similar to that in the illustrations can be recommended to poultrymen for their consideration. This type of house gives adequate ventilation without draughts, sunshine in winter, and shade when required in summer. It will suit most localities, and is very cool in summer and warm in winter.



A side section of the house.

Housing

In general, the construction is similar to most houses, with the important exception that the back or rear wall is the highest with the roof sloping towards the front of the building. In effect, the air circulation has an uninterrupted flow from front to back, where an outlet along the roof between the rafters and the back wall studs provides an exit well above the roosting quarters of the stock, where ventilation is so desirable. In planning the building it is necessary to provide for a 6 in. overhang of the roof at the back to prevent the possibility of rain beating in.

The front portion of the roof overhangs the front of the building for 2 ft. 3 in., thus providing protection against driving rain without checking free ventilation, and at the same time giving some shelter to the attendant in wet days. This form of construction gives a larger expanse of wire netting than is usual. The portion above the bottom 2 ft. 6 in. in front is wire netting, which allows the maximum of sunshine during winter when the sun is low, while in summer the hood provides shade. Further protection in front may be desirable at times, more especially when it is used as a brooder house. This can easily be provided by hinged shutters or removable hessian screens adjusted on the lower portion of the front, with the top portion of the wire netting front always open, thus permitting full ventilation.

In exposed positions and during bad weather it may be necessary to control in part the ventilation at the rear of the house over the roosting quarters previously referred to. A shutter opening inwards and hinged on the top of the plate above the studs and between the rafters can be shut or opened to control ventilation.

A heated atmosphere rises to the highest point in the building, and with the perches situated along the rear wall, as is the common practice, the heated atmosphere rises above the birds to the point of escape immediately above their roosting quarters. In most other types of buildings unless otherwise provided for, the heated air must travel under the roof and seek escape through the front of the building at its highest point. This heated air carries moisture, which may condense and cause damp and musty conditions within the fowlhouse.

The Roof

When designing lean-to buildings, 6 inch laps of iron should always be allowed, as the roof expanse is large and during heavy weather must necessarily carry considerable water. When smaller laps are provided there is always a possibility of leaks.

Perches and Nesting

Perching arrangements should be made easily removable in order to facilitate the control of red mite. The system illustrated in the Department's Bulletin No. 66, "Utility Poultry Keeping," price 1s., is simple in construction and very effective.

Such fittings should be designed to provide secluded conditions where a bird can lay her eggs without molestation from other members of the flock. The actual laying quarters should be large enough to accommodate at least two hens. These provisions will prevent many cracked and broken eggs, and will also assist in controlling the vicious habit of vent-picking, which is often followed by cannibalism.

Water System

No plant can be considered to be fully equipped without a complete and efficient water system. Water contamination may quickly cause the spread of parasitic life and disease organisms, and it is therefore essential that every water system should give protection against contamination by droppings and dust.

Feeding Utensils

Troughs should be strongly made and should be removable to facilitate cleaning and storage when not in use. Feeding troughs should not be left on the floors longer than is necessary for the stock to secure their feed requirements. If left continuously on the floor they become fouled with droppings and dirt, which are always a possible source of disease.

General Conditions

Provision may be made along the front of the buildings for a 2 ft. 6 in. wide concrete path to ensure cleanliness near the house and thus minimise the spread of disease. The cost of construction is more than offset by its advantages, and the path will also aid the staff in working the house under all conditions. Concrete 3 in. thick is sufficiently strong for the purpose.

Slaughterings of Stock

THE following returns of slaughterings of stock at meat-export slaughterhouses and abattoirs for the nine months, May-January, 1940-41, has been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island						
Meat Export Slaughterhouses—						
Auckland	124,616	591,273	101,190	60,630	954,516	221,764
Poverty Bay - Hawkes Bay	50,034	57,173	298,613	172,822	1,018,057	20,547
Taranaki-Manawatu ..	66,096	218,348	119,673	84,762	935,784	121,594
Wairiarapa-Wellington ..	30,360	30,513	113,062	50,491	706,418	28,651
Totals	271,106	897,307	632,538	368,705	3,614,775	392,556
Abattoirs	91,877	28,942	342,719	177,444	57,176	85,520
North Island Totals ..	362,983	926,249	975,257	546,149	3,671,951	478,076
South Island						
Meat Export Slaughterhouses—						
Nelson-Marlborough ..	1,338	10,042	30,912	13,667	119,664	7,527
Canterbury	9,220	41,460	290,415	239,815	1,142,327	24,573
Otago-Southland	7,081	39,460	163,811	136,563	1,393,404	5,288
Totals	17,639	90,962	485,138	390,045	2,655,395	37,388
Abattoirs	40,462	10,539	193,527	97,480	22,592	34,018
South Island Totals ..	58,101	101,501	678,665	487,525	2,677,987	71,406
Dominion						
Meat-expt. Slaughterhouses	288,745	988,269	1,117,676	758,750	6,270,170	429,944
Abattoirs	132,339	39,481	536,246	274,924	79,768	119,538
Grand Totals	421,084	1,027,750	1,653,922	1,036,674	6,349,938	549,482
In addition the following stock were slaughtered at rural slaughterhouses during the nine months ended 31/12/40 ..	55,816	1,288	172,674	Unknown	14,925	20,286
Same Period, 1939-40—						
Meat Export Slaughterhouses and Abattoirs ..	356,866	1,016,837	1,578,546	779,145	5,535,946	434,153
Rural Slaughterhouses ..	57,869	1,511	173,788	Unknown	15,281	21,185
Same Period, 1938-39—						
Meat Export Slaughterhouses and Abattoirs ..	351,546	980,510	1,625,384	797,736	5,446,079	563,109
Rural Slaughterhouses ..	64,352	1,606	162,447	Unknown	14,393	21,406

Slaughterings of Pigs

The 123,568 pigs killed during January were distributed in weight ranges as follows:—

Under 60 lb.	500
61-110 lb.	25,907
111-120 lb.	10,616
121-160 lb.	53,260
161-180 lb.	20,201
Over 180 lb.	5,580
Sundry	7,604

The grading of porkers is 92 per cent. first quality, and 8 per cent. second quality, and of baconers 71 per cent., 22 per cent. and 7 per cent. of prime 1's, prime 2's and second quality respectively.

In teh different weight ranges of baconers the grading is as follows:—

111-120 lb.	87%, 9%, 4% of P1, P2 and Seconds.
121-160 lb.	72%, 22%, 6% of P1, P2 and Seconds.
161-180 lb.	59%, 31%, 10% of P1, P2 and Seconds.

APIARY NOTES — Continued from page 202.

To obviate this condition as much as possible, the honey should not be allowed to run directly through the strainers to the top surface of the accumulated strained honey below, but should be caught and allowed to flow gently down to prevent as much as possible the incorporation of air bubbles, as described in January notes. There can be no excuse for excessive scum (foreign matter) on the surface of the honey, which is an objectionable feature and detracts considerably from the sale value.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

N.Z. Federation of Young Farmers' Clubs

Edited by S. Freeman, Dominion Organizing Secretary

Letter from Secretary of Young Farmers' Club in Egypt

A. Sqn., 2nd Car. Regt.,
1st Echelon, 2nd N.Z.E.F.,
Middle East Forces.

Dear Mr. Freeman,—

I must apologise for the delay in answering yours of September 27, which arrived shortly before Christmas, while we were still up in the desert. With Christmas and New Year celebrations, mails, moves, cancelled moves, re-erecting of camps, and still more camps, time has been pretty full, as you may imagine!

Life in the desert proper was quite an experience, with one very beneficial advantage—we dropped the greater part of Regimental routine which becomes so boring in army life. Unfortunately, we have had to come back to quite a bit of it for a while now we are back here at Helonan for a spell, and we all feel that a few tins of gall-cure would be helpful!

The boys are all delighted to get the "Journal" again, and heartily reciprocate your seasonal greetings for which they thank you and the various district clubs.

Of necessity, while in the desert our activities have been confined to what we could do individually in the way of sightseeing on "leave spell," or in observations of native stock and agricultural customs, etc., out in the desert. Being unable to talk the "lingo" is a severe handicap, of course, when trying to find things out, and in the account which follows I can only give you my impressions of what I saw, so I am afraid it won't give much detail.

Land Described

I will endeavour to draw a picture of the land we have been in for the past five months. We were camped near the Mediterranean coast west of Alexandria, and the coastline consists mainly of white sandy beaches and rocky stretches here and there, generally backed by low sandhills which are so white as to give the impression of being snow covered from the distance. The sand is extraordinarily clean, and somewhat resembles the Lake Taupo volcanic sand. In spite of this sand the hills in many places grow quite large fig and pomegranate groves. The ripe fruit was available when we arrived on the scene, and went very well.

Behind the sandhills along most of the coastline are strips of saltmarsh mainly covered with a small stunted scrub from 6 to 12 inches high, somewhat like our manuka scrub to look at, only in miniature; then comes a low, rocky line of limestone or sandstone hills, or dead flat for miles on end—mainly the latter. Until one has seen it it is impossible to imagine how much featureless, barren land can be viewed at a stretch.

As one moves over it occasional "waddis," or gullies as we know them, show up with odd areas, here and there, where any moisture may collect in the rainy season—covered with a very hardy species of scrub about the size of the scrub on Rangitaiki Plains, seldom above waist high. The bulk of the area, however, is either very stony or a hard clay earth covered with a thin layer of fine dust—a perfect curse when the bleeze blows, which seems to be for about 182 days from the south and 183 days from the north.

The Bedouins have the conservation of water down to a fine art, and make use of every catchment area possible, leading the water—when the rain comes—through a series of shallow trenches into huge cisterns dug out of the ground and cemented bottom, sides, and top, with just a hole in the top to draw water from in their goatskin bags. In other places permanent wells have been dug down to 150 and 200 feet in depth, about 4ft in diameter, and stoned up all the way. Over these wells are erected a couple of posts with a short iron axle and free pulley running in it; the skin bag is let down, allowed to fill, and generally hauled up by a camel or a team of men. The watering of the stock is quite a task, and stone troughs are placed all round the walls and filled in turn. Women and children all take their part in helping with this work.

The Stock

The only stock that we saw, and I think we saw most that the desert holds, were fat-tail sheep, goats (as we know them in New Zealand, only slightly smaller), and camels—the latter a most mournful-looking animal, who seems to have a perpetual grouch and definitely doesn't want any sympathy. We were on the scene as the tribes were being moved back behind the war zone, and were astounded at the quantities of stock in that area—thousands of heads of all these quaint-looking animals went past us day after day for many weeks, and looking over them, and then at the land around us, we wondered where and why, and what they lived on! They were all in good store condition in spite of having, in many cases, travelled several hundred miles.

The sheep, to me, were most interesting, a queer assortment of colours from black, black and white, through various stages of browns and reds to white wools. They are probably the nearest or only present-day example of the sheep from which our own long-wools of today have been evolved. The bow-nose of the Border Leicester is a common sight, and it is not difficult to see the old, fat-rumped, coarse-britched Romney. My apologies to the supporters of the various breeds! Many are lop-earned, with horns or without, and others have alert ears, with or without horns.

The wool is still as it was on what we know of the original sheep—a coarse outer coat of hair and a fine

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silky undercoat of wool, and is used, as far as I can gather, for making up floor rugs, horse and camel trappings, tents, native clothing, etc. All the stock is extremely light in bone, and although long in the leg, they are light of body and carry only about 2lb to 3lb of a fleece at the most. They are very hardy, as the environment demands, and store up vast reserves of fats in their tails in the growing season for re-absorption as food during the long summer months. They are very "back-end," heavy-looking animals in fat condition.

Cropping

After the rains the Bedouins get out their donkeys and camels and begin their agricultural season. Even with slow animals and crude implements it is surprising how quickly the job is done. Each man gets his little one-hand wooden plough with its iron "toe," his camel or donkey and a bag of wheat, and sets out for his allotted acreage, and turns to with a will. He broadcasts his seed by hand over a small area, and then drives his "team" backwards and forwards over it until the surface has been scratched for a depth of about three inches; then the "team" gets a spell while more seed is broadcast, and so on.

When we left, the crops were just beginning to change the colour of the desert, from what we had come to look upon as a permanent clay colour, to a tinge of green as the plants first come through. Later, the crop is reaped with an ancient saw-toothed, hand-made sickle (surprisingly like our own of today), or else pulled, stacked, and seasoned, and then threshed with sticks at the appointed time. During threshing a queer, box-like affair, with a seat on top and a set of disc-wheels underneath, is dragged round and round over the straw—with the "squatter" sitting on top—to chaff the straw, which is then tossed in the air to winnow the seed, and finally stored for summer food supplies. The corn is used for food, and is ground between two old-fashioned flat grinding stones, a daily supply being done at a time.

Fowls they seem to have in plenty, and those of doubtful age, condition, and expectation of life, can be bought for 10d or 1s each while a fat (?) lamb and a handful of feed to "top him off" can be purchased for about 2s.

We are hoping that an opportunity may come in the near future to visit a sugar factory across the river from our present camp, but unfortunately we make our plans nowadays, and then find other plans have been made for us!

Message to N.Z.

We would like you to congratulate the Dannevirke Young Farmers' Club

on the results of their stock drive; it was really a stout effort, and they deserve every praise. Our best wishes, too, to all the other clubs, and may they long continue to carry on the good work and keep the home flag flying high; I think quite the majority of the clubs are now represented by our membership, which stands now somewhere over the hundred mark. I am sorry I haven't a full list of members and their clubs with me just now—unfortunately it is in my kit-bag at base, and I won't be able to get at it for a while—but will send you a list when I get the chance.

I have been asked to thank you for your kind seasonal greetings, and although rather late in the year, to heartily reciprocate them. We are beginning to feel that it won't be so very long now before we see our own fair pastures again—and what a glad sight that will be when this job is over.—Yours very sincerely,

(Signed)
B. A. C. TENNENT,
Hon. Secretary,
2nd Div. Cav. Y.F.C.
(Overseas).

Wairarapa District Debating Final Won by Carterton Club

DEBATING ability of a high standard was displayed by teams from the Carterton and Alfredton clubs in the final of the district debating competition. The subject of the debate was, "That the Practical Farmer has Contributed More to the Advancement of Agriculture than the Scientist."

Taking the affirmative, the Carterton team was ably led by B. Brasell, whose main contention was that farming had been advanced for many thousands of years by practical farmers before the scientist even began to direct his attention to the subject. He also suggested that during the relatively short period over which science had begun to affect farming it had done almost as much to destroy as to improve farming efficiency, and gave as instances the disruptive effect on agriculture of the industrial revolution in England, and the destructive power of scientific warfare. This argument was extended by A. Fisher and W. Campin, the former pointing out that, even where scientific discoveries had aided agriculture, it still remained for the practical farmer to apply these to the advancement of the industry. W. Campin, who ably criticised some of the claims of his opponents, particularly stressed the enormous advances made in animal breeding, to which the scientist admitted that he had made little contribution.

Leading the negative argument for Alfredton, T. Shirtcliff contended that it was unfair to revert back to the "dark ages," and that the argument should refer only to the period of, say, the last 100 years over which scientific research and investigation had concerned itself with agriculture. It was over this period that the greatest advances had been made, and these were due largely to the development of mechanisation, which in turn was made possible by scientific research. He claimed that the development of artificial fertilisers, which was entirely to the credit of the scientist, was alone almost sufficient to establish his case. In support, A. Heckler dealt chiefly with the advances made in veterinary science, and stressed the enormous benefit of disease control, and even the use of disinfectants alone, which had been made possible by the science of bacteriology. Although admitting that perhaps little had been done to assist the animal breeder, S. Ross dealt at length with advances in the science of plant breeding, which had so enormously increased the productivity of our crops and pasture lands, and which had made possible the seed certification scheme.

In his summing up, T. Shirtcliff claimed that the practical farmer himself admitted the claims of science whenever any epidemic or similar trouble occurred by immediately calling in the aid of the scientist. In his final remarks for the affirmative, B. Brasell maintained that all the benefits conferred by science on agriculture over the past 50 years were still insufficient by far to outweigh the steady practical progress made by the farmer from the time when the first primitive hunter began to domesticate instead of hunt his animals.

The judge, Mr. J. Tier, Wairarapa College, in giving the decision in favour of the Carterton team by 194 points to 171, complimented the speakers on their performance, and gave some valuable criticism which must materially assist the debaters on future occasions.

Finalists in the Wairarapa District Debating Contest, 1940. Standing: A. Fisher (Carterton), W. Campin (Carterton), S. Ross (Alfredton), A. Heckler (Alfredton). Seated: B. Brassell (Carterton), J. Shirtcliff (Alfredton).
[D. McLachlan, photo.

Mid-Canterbury Stock Judging

By R. INCH, District Y.F.C. Secretary.

THE annual district Y.F.C. stock judging competition was held recently at the Ashburton A. & P. Show,

and was a great success. The Corriedale sheep were kindly supplied by Mr. R. D. Cochrane, and the Romneys by Mr. W. T. Lowe, to both of whom the thanks of the clubs are due for their generous support.

This year teams of four members competed for the inter-club competition, two members judging each of the two breeds. Eight teams were entered by the various clubs, and competition was very keen. Hinds Club were again successful in this event, their A team, consisting of B. Simmons, E. Withell, A. McKenzie and D. G. Tait, being the winners. In the individual competition D. G. Tait and E. Withell scored highest points, and were placed first equal.

Among the Clubs: Reports on Activities

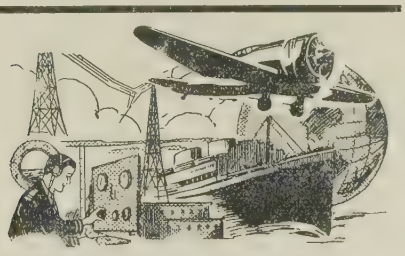
At this time of the year there is normally a shortage of news from the clubs through many of them having gone into recess because of seasonal farm activities. This applies particularly to the South Island, where harvesting and other operations make it necessary for clubs to close down during the summer months; the same applies to a lesser degree to clubs in the North Island, many of which close down for one or two months for haymaking, shearing, etc. At the present time, in addition to the foregoing, a number of clubs have found it necessary to go into temporary recess because of so many members being absent in Territorial camps, which, combined with the number of members already serving in the overseas forces, has in many cases seriously depleted active membership.—Editor.

DUNEDIN.

West Taieri.—Exhibition of films of agricultural and general interest by representative of International Harvester Co. Members of the Farmers' Union and W.D.F.U. present by invitation.

NELSON.

Moutere.—General business. Date of general meeting decided. Talk by Mr. D. Merry, Department of Agriculture on "Increasing Production."



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WAIRARAPA.

Carterton.—Date of annual meeting decided. Address by Mr. Ben Roberts, M.P., on the "Emergency Precautions Scheme and the Home Guard."

Martinborough.—General business. Talk by traffic officer on matters connected with road transport, etc.; numerous questions were asked by members, who took a great interest in the subject.

HOROWHENUA.

Johnsonville.—Discussion re smoke concert; arrangements for club sports meetings. Talk and demonstration by R. Smith (a club member) on "Harness and Leathers."

Levin.—Discussion re stock drive for patriotic funds. Talk by Mr. J. Staples on "The Production of Fat Lambs." At the previous meeting the Dominion Organising Secretary addressed the meeting and took part in discussions concerning the future of the club. Mr. Freeman exhibited some sound films of general interest; members of the Junior Women's Division were present by invitation and were entertained by the club at supper.

MANAWATU.

Bunnythorpe.—Discussion re District Y.F.C. tug-o-war competition to assist the local sports club's effort to raise money for the "Heart to Heart Appeal Fund." Address by Lieutenant A. J. Galpin, an advisory member, on "The Territorials and Camp Life."

Oroua Downs.—Formation of an Auxiliary Ladies' Club. Decided to send two tug-o-war teams to Bunnythorpe Sports. Mr. H. de O. Chamberlain, Department of Agriculture, exhibited interesting sound films of agricultural and general interest.

Rongotea.—General business. Decided to enter a team in the Bunnythorpe tug-o-war contest. Date of annual meeting agreed upon. Talk by Mr. C. J. Hamblyn, Department of Agriculture, on "Science and the Farmer."

WANGANUI.

Mangaweka.—Discussion re the collecting of scrap-metal and ergot. Field day to be held at a local sheep-breeder's stud. Talk by Mr. J. Robinson, Noxious Weed Inspector, Taihape, on "Noxious Weeds and Their Control."

SOUTH TARANAKI.

Hawera.—Parents and friends evening (see separate report in this issue). At the previous meeting a general discussion took place on all matters connected with Y.F.C. work.

NORTH TARANAKI.

Hillsborough-Tarurutangi.—Address by Mr. L. Knowles, N.Z. Dairy Board, on "Herd Recording and the Line Survey System."

Inglewood.—Decided to hold a "working bee" to clean the native trees planted by the club in connection with the Y.F.C. Centennial Memorial. Two letters from D. Gyde, a member on active service. Short address by the club secretary, Mr. J. V. MacIntyre, on his recent holiday trip to Canterbury, describing farming methods, etc.; the talk was supplemented by a fine collection of photos taken by the speaker.

SOUTHERN HAWKE'S BAY.

Ballance.—Decided that a collection of waste material should be made by club members. Date of annual meeting finalised. Address by Mr. C. C. Smyth, manager of the Union Bank of Australia, Pahiatua, on "Banking." At the previous meeting a talk was given on "Ploughing" by Mr. F. W. Blatchford, of Woodville.

Woodville.—Date of annual meeting finalised. Debate with Dannevirke Club, Woodville gaining the decision; this debate was the final of the District Debating Contest.

NORTHERN HAWKE'S BAY.

Matapiro.—Arrangements for talks by two members at next meeting. Talk by Mr. A. W. Whyte on "Breaking in a Hack."

Meeanee.—General business, accounts passed for payment, arrangements for lectures at future meetings, etc. Lantern lecture by Mr. Flewellyn King on a trip from Picton to Mt. Cook, entitled "Westland's Scenic Wonderland."

POVERTY BAY.

Gisborne.—Presentation to Mr. and Mrs. Clarke and family. Talk by Mr. R. E. Alexander, Government Veterinarian, on "The Microscope."

WAIKATO.

Tauhei.—Arrangements for field day and show exhibits. Two boxing bouts were held: J. Green (winner) v. V. G. Harris, and G. Gee (winner) v. T. Osborne. Annual meeting finalised.

Te Awamutu.—Report on club dance, profits amounting to £11 14s 9d. Messrs. W. McKenzie, J. S. Pattison, H. Wyllie, A. S. Wythe, and C. Howcroft gave reminiscences of the Great War; Mr. McKenzie, who also fought in the Boer War, gave further experiences.

THAMES.

Hauraki.—General business. Combined films exhibited by Mr. C. Walker, Department of Agriculture, as follows:—"How to Grow Hogs," "Heredity," "Pollenation," and "Power Farming." The previous meeting was held at Waihi, and was addressed by Mr. A. V. Allo, Department of Agriculture, on "Pasture Management." The awards in the judging competition were: C. Crosbie, 1; W. Mudgway, 2; and J. Sexton; the judge was Mr. S. Hall, of Matatoki.

WESTERN BAY OF PLENTY.

Pukehina.—General business. Talk by Mr. Whitton and Mr. A. V. Allo (Department of Agriculture) on "Herd Improvement for 1941" and "Food Management for 1941" respectively.

Te Puke.—Arrangements for club dance; lantern lecture for next meeting. Talk by Mr. A. V. Allo, Department of Agriculture, on "The Value of Farm Experiments."

AUCKLAND.

Clevedon.—Business meeting.

Franklin.—Mr. Nicholl, Inspector of Stock, to be asked to address the next meeting. Judges selected for stock-judging competitions at Wesley College:—Friesians, C. Wolfgram and R. Franke; Jerseys, H. Jirton and L. G. Shaw; pigs, Hatrick Bros.; horses, J. Appleby and D. Hoult; sheep, W. Pussell and A. Franks. Stewards were also appointed.

Harrisville.—General business. Arrangements of programme for next meeting. Discussion re stock-judging competitions.

Health Notes for the Farm

Contributed by the Department of Health

Prevention and Treatment of Tetanus or Lockjaw

TETANUS, or lockjaw as it is commonly known, is a disease characterised by tonic spasms of the muscle with marked exacerbations. The spasms usually begin in the muscles of the jaw and neck, and in severe cases spread to the voluntary muscles of the body and the extremities. Occasionally, however, the first complaint is of stiffness in the limb in which infection has occurred.

Cause

Tetanus is due to the action of an organism first described in 1884 and named bacillus tetani, derived from the Greek word "tetanos," which means muscular spasm. The name thus indicates the characteristic symptom of the disease. This bacillus is widely diffused in nature; it occurs in earth, in putrifying fluids and manure, and is the normal inhabitant of the intestine of many mammals. The soil in all regions inhabited by man and domestic animals is more or less contaminated by tetanus, and is the immediate cause of most cases of the disease in man.

Distribution

Tetanus spores are not equally numerous in all localities. The infection is more prevalent in warm than in cold countries. Thirty-four cases in New Zealand have been reported to the Department during the last three years.

The soil of certain localities through long cultivation tends to become saturated with the spores of tetanus. Thus, the infection is not uncommon in these places, especially among those whose work brings them in contact with the soil. Tetanus may be a sequence of wounds received during motor-car accidents if anti-tetanic serum is not given as a preventive.

Nature of Wounds

Tetanus may be regarded almost solely as a wound complication. Punctured, lacerated, or contused wounds are much more susceptible to tetanus than clear-cut or open wounds. The size of the wounds is of much less consequence than their character and content. Fatal cases of this disease may develop from trivial wounds, such as a pin scratch, small splinters, insect bites, etc. It may even occur without recognisable wounds. This suggests the necessity of making anti-septic all wounds contaminated by the soil or by suspect foreign bodies immediately or as soon as possible after infection of the wound.

THE WISE(?) MAN

He spent his health to get his wealth,
And then, with might and main,
He turned around and spent his wealth
To get his health again.

Incubation Period

The incubation period or period of time elapsing between the entrance of the organisms and the appearance of symptoms depends on various causes. If the dose of organisms is large and the conditions in the wound favourable to their growth and production of toxins, symptoms may appear in two days. Where the organisms are few and the conditions of growth unfavourable, the appearance of the definite symptoms may be delayed for a month or more.

In most cases definite symptoms begin about the tenth day after the entrance of the organisms to the body. The person infected complains at first of slight stiffness in the neck, or a feeling of tightness in the jaws, or difficulty in mastication. Occasionally, chilly feelings or actual rigors may precede these symptoms. These are some of the early signs.

Prevention

The value of anti-toxin in the prevention of tetanus has been firmly established. Its value lies in its proper and adequate use and in administration as soon as possible after the wound has been received. The experiences of the Great War add confirmation to the protective power of this specific and sovereign remedy. Of 1,242,000 wounded sent to England, 1458 developed tetanus—a little more than one per 1000. In September, 1914 (the second month of the war), the rate was nine per 1000; in October seven, and in December one. By November, 1918, the rate was only 0.7 per 1000. This remarkable improvement was due to giving anti-toxin serum immediately after the wound had been received. Furthermore, in the cases that did develop, the period of incubation was prolonged and the disease less severe.

No truer statement could be made than that in lockjaw an ounce of prevention is worth many pounds of cure, for once the disease develops in its acute form the outlook is grave.

Thorough surgical treatment of a wound as soon as possible is an important measure in the prevention of tetanus. Wounds, however insignificant, should be thoroughly cleansed. Promptness in cleansing the wound surgically is almost as important as thoroughness. Delay in seeking skilled medical assistance is dangerous. A medical officer of Guy's Hospital, London, states that "in Great Britain, owing to the use of prophylactic anti-toxin after all serious injuries, the lesions which often cause tetanus in civil practice are slight and often superficial wounds for which no medical aid has been asked or which have appeared too slight to require anti-toxin, e.g., mild whitlows in agricultural labourers and abrasions which have not been properly cleaned and

scrubbed over. The necessity for anti-toxin in such slight wounds is not at present sufficiently recognised, particularly by those who have not worked in a district where the soil is heavily infected."

Bear in Mind—

As the cause and mode of transmission of tetanus are known, the preventive measures are indicated. Persons who work among cattle and horses and those who work in an environment of animal-manured soil can hardly avoid contact with tetanus or its spores. Wherever practicable, gloves should be worn when working in manured soil. When soil-contaminated skin is injured by cuts, scratches, or pricks, the part so injured should be thoroughly washed and then swabbed with weak solution of iodine. Where the wound is deep and dirty, clean as well as possible and syringe with a solution of hydrogen peroxide, and medical advice should immediately be sought. In any case it is very desirable that the hands should be thoroughly cleansed with soap and water after being contaminated with garden soil.

Prevention lies in a high standard of personal hygiene, careful, early, and skilled treatment of wounds, scratches, etc., which have been exposed to infection, and injection of anti-tetanic serum.

Book Review

"Farming Law in New Zealand"

THE author, Mr. E. P. Wills, B.A., LL.M., M.Com., is to be congratulated upon the production of a most useful tool in the hands of all farmers who, in the language of the author, "regard their calling as something more than an acquaintance with the price of their products." Mr. Wills is well qualified to deal with a work of this kind as, in addition to the educational attainments mentioned, the author is a barrister and solicitor of the Supreme Court and lecturer in Agricultural Law at Canterbury Agricultural College, and in the Law of Property and the Law of Contract at Canterbury University College.

As Mr. Wills points out in his introductory survey, the primary purpose of the book is to present a clear statement of the law in its application to those engaged in the occupation of farming in order that the intelligent farmer may satisfy himself as to the proper course to adopt in minor aspects of the problems which arise in the course of his calling. The book is not designed as, nor is it intended to be, a complete code for the guidance of farmers on all aspects of farming law, and the author particularly stresses the desirability of the farmer adopting the prudent course of seeking competent legal advice on matters where his legal rights and obligations are called in question.

The scope of a work of this kind necessarily covers a wide field embracing a consideration of those legal rules and precepts of the Common Law which affect the farmer, together with a consideration of that portion of the statute law and regulations which regulate farming activities. Thus, the reader is introduced to a discussion on the ownership of land and chattels; the essential elements of an enforceable contract; the acquisition of freehold and leasehold estates in land; leases and agreements to lease; mortgages and the rights, powers, and obligations of mortgagors and mortgagees; the acquisition of title to goods and chattels; the law with regard to animals; incidents connected with land and chattels such as the wrongs of trespass and of nuisance, and liability for dangerous property and chattels; the law as to fencing; the statutory requirements for farms prescribed by various Acts and regulations; land valuation and rating; and the legal processes available for the enforcement of rights.

One is impressed with the entertaining manner in which the various topics are discussed, and by the clarity with which the principles of the law applicable to each topic are expressed. A work of this sort would not be complete without a discussion on the control of property after death, and this topic is appropriately left by the author for treatment in the last chapter of the book. A comprehensive index provides a ready reference to the numerous matters discussed by the author in the book.

The book should be listed as part of the "stock in trade or chattels" of every farmer. Certainly no organisation representing any section or group of the farming community should be without a copy of the book.

Inquiries for the publication should be addressed to "Farming Law," P.O. Box 800, Christchurch.

—A. E. MORRISON, Solicitor, Department of Agriculture.

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THE Good Neighbour

BY "MARY"

From Me To You

WHO was it said "Music hath charms?" Well, whoever it was, they certainly knew what they were talking about, and I am sure you will agree that there is no charm greater than the charm of good music. Music has not the same high place in our lives to-day that it had in our grandmother's day. Perhaps in the rush of modern life there is not the time to devote to its study as there was in the past. Or is it the advent of radio into our homes that has made it pleasanter, or easier perhaps, to listen in to the music of others, rather than create it for ourselves?

Yet, every now and then, we do find folk who gather together just for the joy of making music. I remember still the feeling of utter peace that enfolded me one night when I went to the Christmas party of a group of singers. It was in the midst of the usual hectic pre-Christmas rush, yet for one evening I was taken into another world by the charm of song. It was like drinking clear water from a running stream to hear the voices of these folk. And as a fitting climax to a most unusual evening, they sang the old favourite carol of "Silent Night" in the candle-glow from a decorated Christmas tree.

Music takes many forms. We hear singing—that is music; we hear the piano—that, too, is music; we hear an organ, or an orchestra, or even the singing of birds—all music. But have we any music left in our hearts these days, music for other folk to hear? We are too inclined to shut our hearts up like a music box that plays old-fashioned airs. The music may be still in our hearts, but it is wasted if no one can hear it but ourselves. And sometimes I think even we ourselves fail to hear the charm of its melody.

There is music in your heart—let it out. Every one has a different way of expressing their music—some by song, some by smiles, some by laughter. But whatever you do, don't bottle your music up. The world has grave need of music these days — let your heart be a musical heart, and sing.

Mary

Mary's "At Home"

WHAT a delight it has been to me to receive so many letters from you all! And I have had so much enjoyment from them that I feel I must share bits of my mail with you. So, here in my "At Home" you are my guests, making friends with one another, as I have made friends with you, sharing your ideas or thoughts, your experiences. Don't you think it's going to be fun? Please, then, next time you write to me do remember our "At Home."

—"MARY."

IT was lovely to have son pass over the "Journal" last night and say, "Mum, look at this page!" Well, after a few hours in the milking shed, I had on only my second-best frock, but there had been another son's birthday cake on the table, which allows me to say at least, "We met Mary on Ken's 11th birthday." And how welcome you were!'

—"ANOTHER MARY" (*Morrinsville*).

THANKS so much for a very welcome and pleasant surprise. There always seems to have been lacking the little womanly friendliness in the "Journal," but now I am sure it will be there. It is the little human touch that helps us all along in our often very humdrum life. I agree that we must never be too happy. It is only by pain that we can realise the full of many things.

—"MRS. VEE" (*Hamilton*).

I THANK you for your warmly kind letter, which brought me unexpected pleasure. I like this new bud which the "Journal" has put forth, for I feel that it enhances the appeal of this very necessary periodical, and as this is essentially for the farming community, there is no danger of your section developing the forced hothouse atmosphere which renders some periodicals useless to the average every-day woman. Your section is a channel through which you will have an opportunity of helping in the postwar reconstruction. The struggle for advancement has become a ruthless one, and the spirit is everywhere visible which enables a man to indifferently watch his over-abundance of ripe fruit falling to the ground to rot, whilst there are numerous young families near by who would eagerly relish his overflow.

—"*RAINBOW SEEKER*"
(*Bay of Plenty*).

I WAS idling away a minute or two while the dinner was cooking when I was introduced to you. I am very pleased to meet you, and hope to have many an enjoyable visit. You sound so cheery. Don't knock, come right in. I suppose you must be wondering about me. Well, I am just a farmer's daughter, not a farmer's wife of experience, but am interested in and try to understand those around me.

—"*JEANNE*" (*Rakaia*).

JUST now the garden is looking a little bare in parts, as many of the flowers are over; but I have a great show of dahlias, African marigolds, asters, cosmos, and pincushions. The concrete paths have just recently been done up again, so many of the borders are practically tramped out of existence. However, they won't take long to get into order again, I hope, as the ground is nice and moist. My winter hobby, as I call it, is sewing. I bought my sewing machine out of my own savings when I was seventeen—a few years ago now—and I've done all my own and the family sewing ever since. I lengthen the girls' dresses, do alterations and make all new things during the winter, so that I have merely the routine mending and darning, etc., during the summer. I just love a few wet days occasionally so that I can keep abreast of the necessary work. Some day I think I shall crawl into a cave and be a hermit. Don't you ever feel as though you'd just love to do that?

—"*MARY ANN*" (*Bell Block*).

THE old toy cupboard has just been discarded because we discovered borer in it. Some days later Miss Seven-years-old came running in with a bar of chocolate. "Look, Mummy!" she cried, "this chocolate's got borer in it!" And sure enough there were air holes all through it. Nothing would induce her to eat it—and it had to be discarded like the toy cupboard.

—"*FREIDA*" (*Eketahuna*).

I WISH your pages every success. You struck a responsive chord in my heart writing about those two books of Winifred Holtby's and Vera Brittain's, as I've read them both, and more than once, too.

—"*CROSSROADS*" (*Feilding*).

Helpful Hannah Says . . .

If your parsnips have become limp, cover them with hot water for a few minutes, and they will then peel more easily.

* * *

You will find, if you soak rusty knives in raw linseed oil for a few hours, that the rust will come away easily, and the knives can be polished like new.

* * *

When using golden syrup, heat the spoon before you put it in the tin, and the syrup runs quite easily.

Use a vegetable grater instead of chopping. Vegetables for soup, lemon, and orange peel for soups, cheese for sandwiches—all done so much quicker with a grater.

* * *

If you are taking a thermos flask of tea when you are picnicking, make sure you strain the tea through a fine strainer as you pour it into the flask. Take the milk separately, and your tea will be as refreshing as if freshly brewed.

* * *

To freshen a stale loaf wrap it in a damp cloth for a few minutes. Remove the cloth, and bake the loaf in a hot oven for half an hour.

* * *

To sweeten rancid butter, dissolve a little lime in water, wait until the water clears, and carefully take out some of the water without disturbing the lime. Wash the butter in this, and then again in fresh water.

* * *

To mend broken dishes, apply white paint to the bottom of the dish with a brush. Cut a piece of tape the length of the crack, lay it across the bottom of the dish, pressing it to see that it is perfectly smooth. Put the dish aside for a few days, when you will find it is perfectly cemented. Cracked washbasins can also be repaired in this way.

Will you be the Winner?

WE all know her, we have all met her — the woman who endlessly complains, "Nothing ever happens to me." She is waiting always for something "big" to turn up, and in the waiting, does not realise that "big" things are only a series of "little" things.

"What do YOU do to take the humdrum out of your days?"

Let us share your ways of relieving the monotony of life. Send me your own particular cure for boredom, so we can all try it out. And send them before April 15, please.

Two prizes will be awarded: First 10/-, and second 5/-. Out with your pens once more, and send your ideas to me . . .

"Mary"

¶ CLOSING DATE:
April 15, 1941.

C/o. "Journal of Agriculture,"
P.O. Box 3004, WELLINGTON.

The Tartan Trend

LAST winter the tartan trend in dress was just beginning—this winter it is going to be well established. No longer is tartan kept exclusively for the kilts of the Scots—it is seen every day, everywhere, brightening up the more sombre shades of our coats and costumes.

Let's take a stroll round the city streets on a showery day: there's a lass in a scarlet tartan raincoat, with a cap of the Glengarry type to match; now we meet another scarlet tartan, this time in the form of an umbrella bobbing up and down above its owner. Here comes a smart miss: her coat is navy, but her scarf is tartan, and to complete the ensemble her gloves and handbag are matching too. As she walks her coat swings open a little, and discloses a kilted skirt beneath. There is no doubting the popularity of the kilted skirt, with jersey to match, especially if you are a keen golfer.

I have a girl friend with a green tartan skirt, and instead of using the material for her handbag, she went to the trouble of following the pattern out in wools on canvas. But the finished result more than repaid her for her trouble.

Has your last winter's coat lost its first newness, especially around the pockets and neckline where it has so much hard wear? Well then, with very little expense, you can add a touch of tartan which will smarten your coat for you, and disguise the worn parts.

And don't forget your menfolk! They need brightening up now, more than ever before. What about a gift for himself in the form of a tartan shirt? Besides looking so smart and cheerful, shirts are made in really warm materials, and are invaluable for cold days. Or perhaps he would like a dressing gown in this material?

There are so many colours and designs to choose from, so many ways and uses to which they can be put, that this trend in tartans is a very welcome one indeed. And if you are fortunate enough to have a family tartan of your own, then how proudly you will go forth in your new feathers! So, when you are overhauling your wardrobe in readiness for winter days, remember the tartans, and borrow some of their brightness to smarten your own appearance.

The tartan trend is well illustrated by this star from the studios of Metro-Goldwyn-Mayer. Scarf, gloves and handbag are all matching. The tartan skirt on the left is ideal for the winter.

DELAYS *are* DANGEROUS
EFFECT That POLICY
with the
GOVERNMENT LIFE
TO-DAY

Magic With Kerosene

HAVE you ever made the fullest use of this household commodity? There is no end to the uses to which it can be put, and here are a few of them for you to try.

If your linoleum has become very dirty, scrub it well with sifted ashes mixed with kerosene, and wash it over finally with soapy water.

It helps to keep your gas stove clean, too. If the tiles above the stove have become greasy through grilling or frying, wash them down with soapy water, to which you have added a little kerosene. And to keep the outside of your stove clean, rub it down first with a crushed newspaper, and follow this by rubbing with a soft cloth which has been dipped in kerosene.

Paint vanishes as if by magic when you get kerosene on to the job. Too, if you have overalls to wash which have been used for painting, add a cupful of washing soda and two cupfuls of kerosene to the boiling soapy water, put the overalls in dry, boil quickly, and skim the grease off the top of the water as it rises. Once softened like this, the paint will come off easily.

Do you use your flour bags for dusters, or aprons? Sprinkle the lettering with kerosene, leave overnight, then wash and boil in the usual way.

Windows, too, respond to the magic of kerosene. Rub them over with a cloth dipped in a solution of water and kerosene—only a few drops are needed in a cup of water. Polish with a fresh cloth.

Next time you are cleaning, remember the magic in your bottle of kerosene!

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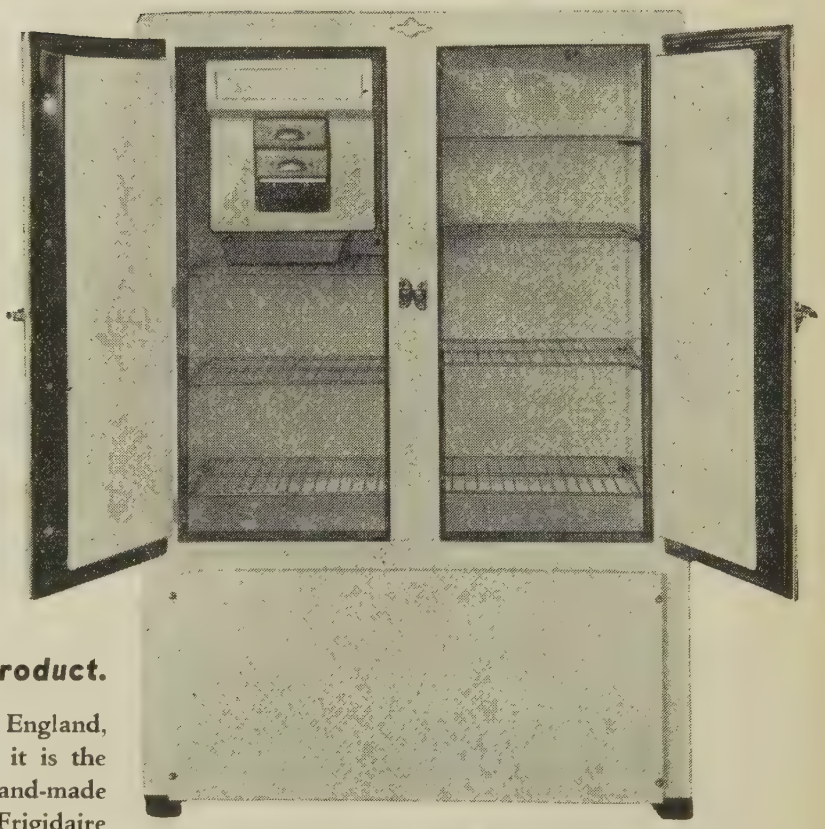

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Lovely and Lively

THE milky way isn't only something to do with the sphere—it can lead you to beauty and vitality, too. How do you feel after a hard day's work? Are you healthily tired, still smiling and ready for another battle tomorrow, or do you feel exhausted, dead beat, and unfit for any more effort until this time next year?

According to how you answer that question any beauty expert can tell you whether you are a clear-eyed, charming girl, or whether you are rather colourless, inclined to have lines around the eyes and mouth, and hair that usually looks dank and lifeless. For on vitality—that little word which means so much—depends your beauty.

Think of the most charming, the most popular person you know. It's a hundred to one that her charms lie neither in her beauty nor her wit, but she has the vitality that gives an illusion of both. And it's a hundred to one, too, that she drinks plenty of milk, for this is a food which contains all that the body requires, a food which is in itself complete.

Milk has a big part to play in beauty culture, yet surprising as it may seem, there are some women who drink practically no milk in their every-day diet. This is not so serious if they have plenty of milk drinks, cocoa, milky coffee, or milk puddings, but to eliminate milk altogether is a great mistake, and may very well account for chance colds, unusual fatigue, and many of the spots that the flesh is heir to.

And what about your kiddies? Do they have enough milk to supply the needs of their vitality? Some kiddies simply refuse to drink milk in its natural state, but they will jump at it if you make it into a temptingly-flavoured milk shake. I have found, too, that a touch of cochineal in the glass works wonders, too. Again I cannot advocate too strongly the need for plenty of milk puddings, for this is a very easy way of disguising milk for the youngsters.

Drink at least one pint of milk each day—it may sound a lot, all at once, but take it during the day, at different times, and in different ways, and before long you will agree that it is not hard to become "lovely and lively" when you follow the milky way to beauty.

Lovely and lively is this Columbia starlet, Edith Fellowes, whose vitality depends so largely on milk.

TREASURE.

These are my loves:
Sparkling dew on grasses, and after,
Noonday brightness; singing birds;
And the sound of children's laughter.
Pale days, misty and grey with peace;
Running water; and waves that break
In mighty majesty on rocks; deep,
Cool reflections on a purpled lake;
Sweet-smelling fragrance of the lavender;
White magic of a moonlit night . . . .
These, these are mine to treasure always,
They were made for my delight.

While the Log Burns . . .

"Hangman's House"

—By Donn Byrne.

NO, don't be misled by the title! It's not the latest in thrillers, but of the many novels written by Donn Byrne, this is the one I have enjoyed the most. It is a poignant, human story, written in a convincing manner, and peopled with folk we would be happy to know. It is a book with an Irish accent, breathing Irish beauty, and written by one who knew and loved Ireland as Burns knew and loved Scotland.

The story tells of Connaught O'Brien, who, to please her father (who is known in the district as "Jimmy the Hangman") marries the swaggering John D'Arcy. However, D'Arcy proves to be anything but the perfect husband, and as the story progresses, Connaught grows to lean more and more on the companionship offered by her near neighbour, Dermot.

It is hard to convey to a listener all the beauty that lies in the book. Donn Byrne writes with the pen of a poet, his prose has the ring of verse, and he plays with words as a musician plays with musical notes. He captures beauty with an artless ease, and restores romance to her old, high place in our hearts. And, as a lover of Nature, his pen drips with the fragrance of the Irish countryside as he describes the coming of spring: "She came with the silver of the foggy dew about her feet, and the sun in her hair, yellow as yellow wine, and about her was a garment of apple green, and the coolness of her hands was the coolness of the singing rivers. And the ripple of the grass, and the winds perfumed with clover were her heralds . . ."

The characters that Donn Byrne creates live with us. In a few lines he brings us a word picture of his heroine, which makes you feel that if you should come face to face, unexpectedly, with Connaught, in the street, anywhere, you would know immediately who she was. "There was the Connaught in the slim frock, and with her hair done in the Irish manner, the white division down the centre of her head, the lovely mass sweeping in a sweet line to the great knot at the nape of the neck, that was lissom and slender, like the stalk of some great flower. This Connaught's eyes were not keen and direct, but shy and dreaming. And this Connaught seemed taller than she actually was, as the first Connaught seemed less tall."

When it's springtime in the heart, spring is everywhere.
—Indian Proverb.

There is plenty of action in the book, and a splendid description of a horse race, which goes to show that the writer was a lover of animals, as well as of Nature.

As the story draws to a conclusion, Dermot and Connaught find happiness together, and you are glad with them that their day is won, because of all they have suffered. It is a book which keeps your interest from beginning to end—you feel you could chase John D'Arcy to the very end of the earth to obtain your revenge for his treatment of Connaught; you are imbued with the quiet peacefulness of the spirit of Dermot's Quaker mother, Anne; and all the time you are hoping against hope that Dermot will gain his Connaught, despite all the setbacks.

To any of my readers who have not yet met Donn Byrne, I can recommend "Hangman's House" as a book you will remember, a book you will want to read and read again; and to those readers who have already found the magic in Donn Byrne's writing, I know this book of his will not prove disappointing.

Our Competition

"Should Farm Girls Leave Home Now And Take Up Work in the City?"

THERE were ever so many entries for this competition, and it certainly augurs well for the future of our farms to find so many of you with the same answer, "Yes." For in almost every instance your answer was "Stay on the farm—it is there a girl's duty lies while the war lasts."

I wish I could give prizes to you all and publish all your essays, but that is not possible. Even if you did not win a prize, I hope you will continue to send me your ideas from time to time.

First prize goes to "Mrs. A.M.," Wanganui; second to "Alter Ego," Clinton; and highly commended, "Mrs. Vee," Waikato, "Rainbow Seeker," Bay of Plenty, and "Town Girl," Wellington.

Here are the winning essays:—

First Prize

WHEN it comes to leaving the farm for a job in town, if a girl goes generally it is because she wants a change, or expects to better herself financially, socially, and educationally. If she thought of doing that physically she would drop the idea promptly. Only in their 'teens young people don't so often think of saving and increasing health for the years ahead, as they take for granted it will always be there, like sunshine and fresh air.

Those are matters of course on a farm, like plenty of space and of wholesome food, all of which, especially to folk used to them, are important needs for health, which spells happiness, and incidentally, attractiveness. The staled atmosphere, umpteen times used over, of shops and offices, is literally poisonous after the open air of out-of-doors. And after the feeling of space and freedom from strangers' observing eyes it is stifling to lose the spaciousness and plenty of a house surrounded by paddocks, outside garden and orchard, to find one's only privacy in a bedroom of a lodging in some house on a town section overlooked intimately by neighbours on every side, all the time. It makes a lot of difference to health and nerves, that loss of privacy, that shut-in feeling, with the only change the regular hurry along asphalt pavements.

It makes a surprising difference also to have to realise the greater, and increasing, cost of wholesome food, plentiful on a farm, strictly rationed by **your** purse, and not nearly as fresh, in town. You can't go out into the garden and pick salads or fruit or flowers, as you have always been able.

You can buy things more easily. Yes, only that most of the other shops are shut too when you get out and it is always unpleasantly surprising how fast money goes when **everything** has to be paid for.

It is much harder to pay one's way, let alone save, in a town.

If you don't feel satisfied, perhaps with not getting award wages, at home, you know there are always places open on other farms, for you to try out changes of conditions till you feel suited, and with every one you learn something different. There is more to learn on a farm, if you try to find out all its possibilities and interests, than in the drying routine of most town jobs.

And there is another fact well worth your considering. On a farm you are helping to win the war, by making it possible for a man to go to the Front, where he is **needed**, and by steadying the main industry of the Dominion, food production. The whole economic welfare of New Zealand, and its value to the Empire, is based on that, so if you stay on and help you are doing important work, holding a vital post on the Home Front, just as much here as in the British branch of the Land Army.

Also you are helping to ease the dreadful after-war slump and unemployment problem. For if the farms have been kept going a man can return to his job there, marry a girl and they can carry on together.

So for your own health, for financial benefit, for helping to win the war, and for solving after-war problems, stay on the Farm.

"MRS. A.M.," Wanganui.

Second Prize

CERTAINLY! If they wish to, and have the urge to get into the swim of things rather than rusticate in the back-wash of the backblocks. There is too much altogether of this sentiment abroad.

"Country's country and Town's town, and never the twain shall meet," to misquote Kipling! If a farm girl has the farm "in her blood," nothing on earth will induce her to leave the farm. If she hasn't, then it is better for everyone that she leave the farm at once—a square peg in a round hole is useless to everyone, including herself.

So to the "Farm Girl" I would say, "Go where your bent leads you! Don't stick on the farm now just because it's wartime. If you feel you can be a better car-conductor than farm girl, go to it, and let the city girl who has a sneaking longing for farm work, take your place."

The only good work that is ever done in any job is done by the one who loves her work in all its ramified details. Therefore, if you love the farm, stick to it, and then the More Production Campaign becomes not a mere catchword, but a Living Reality.

"ALTER EGO." Clinton.

Highly Commended

WHAT is the answer of the farm girl's own conscience to your question? Self-interest might easily tempt her to exploit the present abnormal situation created by the war to her own temporary advantage, but if she is the sister or the sweetheart of a lad who has offered everything, even life itself, in this conflict between good and evil, freedom and the grim spectre of a world-wide application of the infamous "New Order"—well I think she will "carry on" like the true civilian soldier she is, where her training and experience can be utilised to the fullest national advantage, on the farm.

In the cities there are still a large number of people employed in luxury and non-essential occupations and people of independent means, and I think that the ranks of recruits for essential war work might well be augmented from these sources.

In conclusion, I can only pay tribute to the typical farm girl, who wears

no badge, parades in no exciting uniform, and yet cheerfully works long hours week days and Sundays, wet or fine, and I'm sure that it warms the heart of the man overseas to know that she is there at home, matching his sacrifice with her own.

"RAINBOW SEEKER,"
Bay of Plenty.

ACTUALLY, it is the girl that counts. Some never will adapt themselves to the simplicity that must ever be farm life. Life in the country should be scheduled as are town jobs and things would be more attractive. Again, it is loneliness that is the "last straw" in many a girl's life, and if a group system could be arranged where the girls could meet twice a week for sports, twice a week for merely social evenings, and twice a week for lectures modernising all our duties, then life would be so full that none of us girls (old or young) would have time (or excuse) for lamenting our lot. Personally, I vote for country every time, but not everyone thinks like that, and to attain successful running of our producing area, many changes are due. If others "pay" at forty hours why don't we?

"MRS. VEE," Waikato.

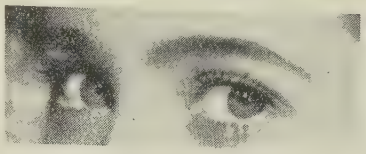
OFTEN, I think, there is every reason for farm girls to follow some profession, if necessary leaving home to do so. So many girls on the other hand, after perhaps a year or two's secondary school training at the nearest town, return for a year or so at home and soon lose contact with the city and become immersed in country life once more. Life on a farm is certainly a continuous one with plenty to do, but there is rarely enough work all the year round for more than two women, at any rate, and where there are two or three daughters, there is every opportunity for the less domestically inclined to go elsewhere. Nursing or teaching for instance would both be useful in after life, if the girls eventually settle on a farm.

But now it is different. It is wartime, and everyone is urged to fill the position she is best suited for. There are still the attractions of bright lights, companions, pleasant work, and better openings that city life affords, but some of these can be partly gained in the country. At the present, there are certainly more openings available in town, but some of these positions are only for the duration, and are being kept open as far as possible for the men who return from the war. Perhaps there are vacancies in factories or in offices, but I wonder if such positions would appeal long to country girls. As they are away from home, there is always board to consider, and sometimes that is not so easy to obtain.

In the country there is the shortage of domestic help, since so few girls are willing to leave town just to do housework. There are the cows to milk, and at present there is little excuse for the women not to do such jobs as that. And out in the field, in spite of the need for increased production, it seems almost probable that some crops may rot away through sheer lack of labour. Men have grown to prefer the forty-hour week to the strenuous occupation of the farmhand and now, with the application of conscription, the country people are bearing the brunt of it. One man can mean such a difference to the day's work on a farm, and yet some must go. And it is here that the girl can offer. There is plenty of lighter work with the tractor or the horses, and she need not assume complete responsibility—merely give the farmer a hand. If the women of England can do it, those of New Zealand are equally capable. And there is always the V.A.D. training to fit them more for real war work, if they desire it.

"TOWN GIRL," Wellington.

"... Only Skin Deep"



Be Kind To Your Eyes.

THE days of summer are drawing to a close. Before long the clocks will be going back half an hour, and before long we will find a lot less daylight, and a lot more artificial light for our eyes to look at.

Your eyes—have you ever really given them their fair share of attention when you are making yourself lovely? Our slaves every waking minute, and yet we take them so much for granted. What about giving them some very special attention this winter? After all, they are your most precious possession, and once they have lost their sparkle, you have lost some of your sparkle too.

Have you an eye-cup in your beauty outfit? They cost so little, and yet are invaluable. Give your eyes a daily eye-bath—you clean your teeth every day, don't you, and wash your face regularly, but how often do you wash your eyes? Use a very weak solution of boracic acid and warm water, but the water is to be only warm, and never above bloodheat. If your eyes are tired, dip pads of cotton wool in a very mild, warm solution of salt and water, lay them over the eyes, and lie down for a few minutes, preferably in a shaded room. Now apply a good eye-cream, but remember to do it very gently, for the skin around the eyes stretches so easily. Smooth the cream gently over the eyelids, and underneath the eyes, keeping an upward movement all the time.

If your eyelashes are skimpy, and break easily, encourage their growth by applying a little olive oil on the lashes nightly.

A suggestion of eye shadow along the upper and lower lid gives the illusion of size to the eyes, and darkness to the lashes. Don't use too light a shade of eye shadow, for this will make your eyes look artificial. And never use a black crayon, for you can work wonders with the lighter shades of brown, grey, or blue.

Don't worry if you find you have to wear glasses. Nowadays they are made in so many styles and shapes that there is surely one pair of glasses which will suit you to perfection. And when you find you have to wear glasses for indoor work, such as reading and sewing, please do respect the wish of your optician, and wear them. The glasses relieve the eye-strain, and if you have to wear them, then wear them, because although you may think you don't look quite so nice with your horn-rimmed appendages, you may be sure that your eyes without them are strained, and so make you look older immediately.

Remember, too, with winter coming on, that perhaps the lighting in your house needs an overhaul. Do you read in bed in a poor light? Make sure you have a light over your bed if you indulge in this habit, for nothing plays havoc sooner with your eyes than reading in a poor light in bed.

So be kind to your eyes, and they will be kind to you. Treat them sensibly and you will find that they will be willing to serve you faithfully to the end of your days.

Make Your Own Tomato Juice

— By —
L. W. TILLER,
Fruit Research Officer, Department of Scientific and Industrial Research.

SINCE its initiation in a small way in the United States in 1928, the tomato juice industry has made spectacular headway, until today more than 16,000,000 cases of juice are packed annually in that country. The appreciation and use of the product has since begun to spread to other countries, but it cannot be said yet to constitute a standard article of diet elsewhere than in the United States. Unavailability or price of commercially prepared lines may be partly responsible for the relative slowness of its headway in New Zealand, and it is the purpose of this article to indicate how, with reasonable care and a minimum of equipment, it is possible for any housewife to prepare a most attractive article of considerable dietetic value.

Vitamin-content

The tomato fruit is notable particularly for its content of vitamins A and C, and properly prepared juice retains these to a very considerable degree. As vitamin A exists only in the solid portion of the tomato and is virtually unaffected by the heating and oxidation involved during processing, the content in the finished juice is determined almost entirely by the amount of pulp included. Vitamin C is very resistant to heat, but is fairly readily oxidised at high temperature. Nevertheless, in a well-made commercial tomato juice the loss of vitamin C during manufacture should not amount to more than about 20 to 25 per cent. In domestic preparation the loss would probably be greater than this, but the juice could still be considered a good source of this vitamin.

Tomato juice consists of the liquid portion of the fruit together with a certain proportion of the solid fleshy part. It should be noted that tomato juice for use as a table beverage is differentiated from the pulped and strained tomato that housewives normally preserve for winter use in soups, etc., by reason of the fact that juice does not include the heavier, coarser parts of the flesh. These make a beverage juice too lumpy in texture, and also settle out too rapidly. In order to avoid waste, however, the unused fleshy portions can afterwards be rubbed through a sieve and added to other tomatoes that are being pulped for puree or sauce.

In selecting tomatoes for the preparation of juice, preference should be given to the less fleshy and more juicy types, whereas for puree and sauce manufacture the fleshy types are better. It is a prime essential that only fully-ripe tomatoes of high colour should be used. Green tissues turn brown during processing and spoil both colour and flavour. Irregular and odd-sized fruit can be used but it must be sound, clean, and free from disease.

Stages in Processing

The various stages in processing are as follows:—

(1) **Thorough Washing.**—This ensures removal of dust, spray residues, and any mould that may be on the surface of the fruit.

(2) **Trimming.**—Any pieces of hard, green tissue must be cut out. For the highest-class juice the cores are also removed. The work of trimming must be carried out as rapidly as possible, for the reason explained in the next section, and it is therefore advantageous to have as much help as possible with this operation.

SLUMBER SONG.

Over all the world a quietness serene:
There is no shining sun on flowers,
No sound to mark the passing hours,
But just a peace to hushen thee, colleen.
Husheen O! and sleep,
Dear heart, do not weep.
All the world is stilled
To let my colleen sleep.

Pillowed on a cloud a silvered crescent lies,
It's sharing with my dear one rest,
The long night through you'll be caressed
By softest winds that breathe from purpled skies.
Husheen O! and sleep,
Dear heart, do not weep,
All the world is calmed
To hushen thee to sleep.

(3) **Pre-heating.**—The trimmed tomatoes are put immediately into a large aluminium or enamel saucepan, without addition of water, and brought as rapidly as possible to just on boiling point, keeping the lid on as much as possible to exclude air. It will be necessary to stir occasionally to prevent sticking, especially at first. The fruit is kept just below boiling point (180deg. to 190deg. F.) for a sufficiently long time to soften it for sieving. This should not take more than five or ten minutes at the most. It is preferable not to boil the pulp at this stage in case it darkens too much. Iron, copper, or brass vessels should not be used in any circumstances, as these metals spoil colour, or flavour, or both.

The reason why trimming and heating must be carried out as rapidly as possible is that the juice of the raw tomato contains a very active chemical substance called an enzyme, which will destroy the pectin in the solid matter of the tomato in a very few minutes. This is undesirable, as pectin gives "body" to the juice and helps to prevent separation of the juice into liquid and solid layers in the bottle. The enzyme is released immediately the fruit is cut or damaged, and so must be inactivated by heat as quickly as possible. At a temperature of 180deg. F. it is inactivated in less than one minute.

(4) **Sieving or Extracting.**—The liquid and semi-solid pulp have next to be separated from the seeds, skins, cores (if left in), and coarse pulp. A fine hair-sieve or stainless-steel sieve is suitable for this purpose, but may be difficult to obtain. If so, an ordinary kitchen sieve can be used, as long as the tinned surface of the gauze is bright, with no rust showing through. An alternative, available in some households, is the type of heavily-tinned juice-extractor which consists of a tapered screw revolving in a conical housing, with a perforated metal screen underneath to permit escape of juice. The end-screw controlling the amount of pressure applied should not be too tightly closed, or too much solid matter will come out with the juice. Whether this type of machine is used or whether the pulp is rubbed through a sieve, the aim should be to get about three-fifths of the original weight of the fruit recovered as juice. Thus 10lb. of tomatoes might be expected to yield between 4½ and 4¾ pints of juice.

(5) **Seasoning.**—Salt should be added at this stage to bring out the flavour, and according to personal taste a small quantity of sugar may also be added. As a guide to quantities, a mild seasoning would consist of 1 teaspoonful salt and 1 teaspoonful sugar to each quart of juice. Many palates will demand more than this, even twice these amounts not being excessive.

(6) **Final Heating.**—In order to dissolve the seasoning and to sterilise the juice ready for bottling, it is next brought just to the boil in the aluminium or enamel saucepan, the lid being

kept on, and is simmered for not more than five minutes, when it is ready to bottle.

(7) **Bottling.**—This can be done in either the usual clip-on or screw-top fruit jars or in bottles sealed with crown-caps. The screw-top fruit jar has the disadvantage that the acid and the salt in the juice tend to corrode the lids rather badly, but lids can be expected to give at least two seasons' service. Because of the difficulties of securing a suitable grade of cork and of sterilising them completely, the use of ordinary corked bottles is not really recommended.

Tomato juice is not as difficult to sterilise as are some juices, and provided the bottles and closures are heated before filling, the residual heat of the juice can be relied upon to complete the sterilisation without the need for subsequent "cooking" of the sealed bottles.

Warming the Jars

Bottles are easily warmed by placing in a cool oven, the temperature of which is then raised to about 200deg. F. The bottles will then be much too hot to handle without the use of a thick oven-cloth, but should not be so hot that the juice sizzles when it is poured into the bottle. This preliminary warming not only assists the sterilisation, but also obviates cracking of the bottles during filling.

While the bottles are being warmed the lids or other closures should also be sterilised. If fruit-jar glass tops or screw caps are being used, they can be put in the oven along with the bottles. The rubber rings should be boiled for a few minutes before use. Crown-caps can be sterilised by heating in a steamer or in a sieve placed over a saucepan of boiling water, or else in a double heater of the milk-boiler type. Plain corks are much more difficult to sterilise properly, and must be boiled in water for an hour or two. Old, used corks should be avoided at all costs, and only the best quality corks, free from cracks, should be employed.

Work should be so arranged that the bottles are hot by the time the juice has completed its final heating, and they are then filled as quickly as possible, sealed immediately each one is filled, and turned upside down to cool. Bottles of the crown-cap type should be laid on their side unless a wooden rack is available to support them in the inverted position. It is to be noted that bottles should be filled to the maximum of their capacity so as to reduce the air space to a minimum. This helps the sterilising, and also lessens the rate of loss of vitamin C during subsequent storage of the juice.

The hot containers should not be exposed to cold draughts before or after filling, nor should they be stood on any cold surface, such as a metal or stone bench-top or sink. A dry wooden bench or table, with or without a few thicknesses of dry newspaper, makes a safe place on which to work.

An inspection for leaks should be made as each bottle is sealed, and as soon as the bottles have become cold they can be stored away.

It is understood that some measure of success has attended the storage of tomato juice in well-washed treacle tins or other similar tins with push-in lids. There is no objection to this as regards the metal container, as a good-quality, plain, unlacquered tinplate is recognised as being satisfactory for the storage of tomato pulp. There is more than a considerable risk, however, that the lid will not be completely air-tight, and if it is not so, organisms causing spoilage will be drawn from the air into the can as the juice cools. This type of container is, therefore, not really recommended.

Use of Tomato Juice

In the United States, tomato juice is used largely as a breakfast drink, although it is very acceptable before almost any meal. It makes an excellent afternoon drink for young children as an alternative to orange or apple juice. As an appetiser it is often served as "tomato cocktail," prepared by mixing the juice with a small quantity of Worcestershire sauce. More elaborate recipes contain vinegar, celery salt, lemon juice, and tabasco sauce, in addition to Worcestershire sauce.

FEEL TIRED
IN THE MORNINGS?

Feel weary when you wake up?
Shaky on your feet when you struggle out of bed?
Eyes heavy, limbs heavy, mind heavy?
It's probably constipation.
You may be "regular," yet expel *incompletely*. Poisons are left. Contaminate the blood. Slow you down. Sap your vigour.

For this condition there is a simple prescription. Doctors have been repeating it for years. It is Kruschen Salts. Food fads come and go. Fashions in diet have their day and are forgotten. But Kruschen Salts remain unquestioned. They don't drug you. They don't scour you. There is nothing secret about them. The analysis is on every bottle. And doctors recognise this analysis as a basic prescription for a basic disorder.

YOU'LL FEEL ALL THE BETTER FOR A PINCH OF
KRUSCHEN
Take Kruschen in tea or hot water.
2/5 *a bottle at Chemists and Stores.*
740

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When you can make PERFECT Butter at home—in 60 Seconds and in any weather with the—
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The latest and greatest labour saver ever invented for farmers' wives, and people who keep one or two cows. . . . Simple to use (just follow the easy directions) . . . no trouble to clean (all parts metal with chilled steel container). Nothing to wear out. Actually pays for itself MANY times over in one season. Already in use in hundreds of homes. £4/15/-
Limited supplies ONLY are available.
Write for full information on this marvellous Kangaroo Churn to—
Sole N.Z. Distributors:
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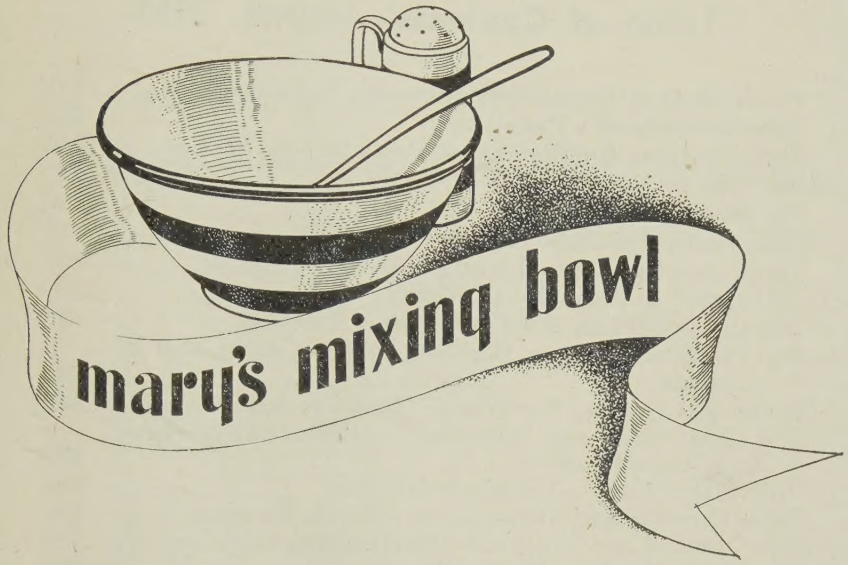
Apple time is here again . . .

Gives you a real thrill just to see the apples piled high in the shops . . .red and gold, jade-green and yellow . . . striped with sunset colours . . . a temptation to bite right into their crisp, juicy sweetness. Yes! It's apple time again! Makes you think of sun-flooded orchards rich with the scent of the apple harvest. Apples for health! For real enjoyment! Buy them by the case . . . see that every member of the family has one in their pocket as they go off to work or school. Cook them! Pies, puddings, tarts and cold sweets! Hurrah! It's Apple Time Again!

Serve Apples Daily *and serve your Country too!*



APPLE SPONGE PUDDING

Half fill a pie dish with hot, cooked apples, well sweetened and flavoured with lemon cloves. Pour over the following sponge mixture: 2ozs. butter creamed with 4 ozs. sugar; add 1 egg and beat well to cream. Add 6 ozs. flour with ½ teacup milk. Beat well and bake about half hour.

APPLE CAKE WITHOUT EGGS

One cupful moist stewed apples, 2 cupfuls flour, 2 teaspoonsful spice, ½ teaspoonful nutmeg, ¼ lb. butter, 1 cupful figs or cherries, 1 cupful dates, 1 cupful sultanas, 1 cupful raisins, a little preserved ginger, 1 teaspoonful bicarbonate of soda, 1 cupful sugar.

Rub the butter into the dry ingredients. Stir in the apple and fruit; lastly add the soda dissolved in ½ teacup of hot water. The mixture should be stiff. Bake in a very slow oven for three hours.

APPLE SAVOURY

Slice 1 large onion to two large apples; stew until tender with a little water, butter, pepper and salt, and turn into a pie dish or casserole. Beat 2 eggs and 1 cup milk with ½ cup breadcrumbs and 2 ozs. grated cheese. Pour this over the apple mixture and bake in a good oven for about ½ hour.

APPLE OMELETTE

Apple omelette, served with roast pork or boiled spare rib, is very delicate. Take 4 large apples, 2 eggs, 1 cup of sugar, and 1 tablespoon of butter; add cinnamon and other spices to suit the taste. Stew the apples until they are soft, mash them and add the butter and sugar. Let them cool before putting in the beaten eggs. Bake till the whole is brown, putting the omelette either in a shallow pudding dish, or in two tin plates.

APPLE JELLY

Cut up apples (which should be on the green side—Granny Smith make the best jelly). Allow 1 pint of cold water to each 1 lb. of fruit, boil to a pulp, strain through a jellybag; add ¾ lb. of confectioners' sugar (brewers' crystals if available) to each pint juice; boil till it jells.

TOMATO AND APPLE CHUTNEY

6 lbs. ripe tomatoes, 6 lbs. apples, 2 lbs. onions, 2 lbs. brown sugar, 2 ozs. garlic, 1 teaspoon cayenne, 2 tablespoons salt, 2 tablespoons ground ginger, few chillies. Cover all with vinegar and simmer 2 hours, stirring constantly.

APPLE AND BLACKBERRY MARMALADE

Equal quantities of apples and blackberries and 1 lb. sugar to 1 lb. pulp.

Wash the apples, and cut them in slices without removing skins and cores. Pick the blackberries carefully, discarding any that are unsound. Put both kinds of fruit into a preserving pan with just enough water to keep them from burning. Cook until reduced to a pulp, stirring frequently. Then sieve, to remove the skins and seeds. Return the sieved pulp to a clean preserving pan with sugar in the above proportion, and stir almost constantly for 20 minutes or until it is firm. If this is put in small pots it can be turned out in shape when wanted, and is very nice served with blancmange or with cream.

HOT APPLE ROLLS

Make a biscuit dough with 2 cups of flour, 2 teaspoonfuls of baking powder, ½ teaspoon of salt, 2 tablespoons of sugar and 3 tablespoons of butter. Moisten with ½ cupful of liiquid, using half milk and half water. Roll out and spread liberally with chopped apples. Roll up and cut into pieces, each about an inch and a-half to two inches long.

Have ready a syrup made from one cup of sugar and a pint of water. This should be put in a deep dish and while it is simmering the apple rolls should be placed in it, cut side down. Put a small dab of butter on each roll and bake in a hot oven until a golden brown.

SOUTHERN STYLE BAKED APPLES

Core and cut into halves 6 fine apples. Lay in baking dish skin down. Pour over this a syrup made of sugar, water and lemon juice, using about 2 cups of water, ½ cup of sugar and 2 tablespoons of lemon juice. Bake until tender, being careful not to break. Place these on a serving dish; fill the centres with apple jelly and pour the liquid from the pan over them. Press a meringue on to the tops of apples; bake in a moderate oven just a few minutes.

Best Mushroom Recipe

The prize of 2/6 is awarded to Frances White, "Otama Homestead," R.D., Gore, for the following mushroom recipe:—

MUSHROOM EPICURE.

½ lb. mushrooms, 2 T.B. butter, ½ T.B. lemon juice, 1 tsp. chopped parsley, ¼ tsp. salt, ¼ tsp. pepper, ¼ teacup thick cream, toast.

Beat butter to a cream, add lemon juice, drop by drop, then stir in salt, pepper and parsley. Place sauce in bottom of Pyrex baking dish and cover with mushrooms (made into shape of a cone on top). Pour over the cream and cover. Bake about 25 minutes. Keep mushrooms covered until taken to the table, so that they retain their fine flavour.

When Soup Is Served

What is your soup like when your men-folk come in hungry and tired after a day's hard work in the cold air? Steaming and appetising, so that all the plates come back for more?

Send your favourite recipe for soup to the "Mixing Bowl."

A cash prize of 2/6 will be awarded for the best recipe received by April 15, 1941.

SWISS APPLE TART

1½ lbs. apples, ¼ lb. sugar, ½ lb. dates or prunes, 1 teaspoon spice, 1 teaspoon cinnamon, a little water.

Prepare and stew the fruit in the water, cool and add the spices.

Pastry: Biscuit crust, ½ lb. Add 1 teaspoon each of cinnamon and spice to the flour before mixing. Make as for a large mince tart.

APPLE BIRD'S-NEST PUDDING

One teacup of sago or tapioca boiled in a pint of water until transparent; sweeten and flavour with lemon juice. Place peeled and cored apples whole in a buttered pie dish, fill the centre of each with sugar and small piece of butter. Pour the sago over and bake until apples are tender.

COLD APPLE PUDDING

1 pint stewed apples, ½ oz. gelatine, 1 small sponge cake, 3 ozs. sugar, 1 pint custard, juice of 1 lemon.

Line a mould with the sponge cake cut in strips, mix the cooked apples, sugar, gelatine and lemon juice (and grated rind if liked) and pour into the mould; place a round of sponge cake on top. When cold and set, turn out and serve with custard.

APPLE TURNOVERS

½ lb. flour, 1 heaped teaspoon baking powder, ¼ lb. butter, 1 egg, 2 tablespoonsful sugar, 2 tablespoonsful water, pinch salt.

Mix as for a cake, adding flour mixed with baking powder last; roll out thin, cut into squares, fill with nicely stewed apple, double over, wet the edges, bake in a hot oven.

Mushroom Recipes

MUSHROOM SAVOURIES.

Prepare mushrooms and cook in little butter for few minutes. Drain off liquid and chop up mushrooms. Prepare sauce as follows:—

1 tablespoon butter.
½ cup milk.
1 tablespoon flour.
Salt and cayenne to taste.

Melt butter in saucepan, stir in flour. Allow to cook about three minutes and add milk. Gradually stir till it thickens. Add cayenne and salt to taste. Now add liquid from mushrooms, 1 tablespoon of cream and chopped mushrooms to sauce, and serve on croutes of bread prepared as follows:—Cut slices of stale bread in circles and fry in hot fat and drain well. Garnish with chopped parsley.—**Mrs. M. J. Powell (Napier).**

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NUT AND MUSHROOM BOUCHEES.

First make a batter consisting of 4 oz. flour, 1 egg and 1 gill milk. Stand this aside for as long as possible, at least an hour. Mix 3 oz. of ground nuts and 2 oz. of chopped mushrooms in with the batter; season to taste, and drop spoonfuls at a time into hot fat. Drain and serve with white sauce and vegetables.—**"Plain Jane" (Taupiri).**

PRESERVED MUSHROOMS.

If possible, have the small button-shaped mushrooms. Peel them and place in boiling water for five minutes. Then immediately place in cold water for two or three minutes. Pack jars and fill up with slightly salted water. Sterilise the same as you would fruit, for one and a half hours. When cooked overflow with the salt water at boiling point and seal jars.—**"Zay" (Westland).**

MUSHROOM LUNCHEON.

Select a small marrow, and scoop out the seeds. Fill the cavity with chopped mushrooms seasoned, a few peas, and diced onions. Tie the end of the marrow with string. Place it in a casserole; baste with 2 tablespoons fat and ½ cup water, frequently turning the marrow in the dish, till a fork will pass through it easily. Serve hot with butter sauce, made by melting ¼ lb. butter and sprinkling in 1 tablespoon of very finely-chopped parsley. This makes an ideal vegetarian luncheon.—**"Em Ess" (Clinton).**

MUSHROOM OMELETTE.

Fry small mushrooms till both sides are lightly browned. Whisk two eggs, yokes and whites separately, adding the yokes when the whites are beaten stiff, seasoning with salt. Pour the eggs into a hot buttered frying-pan and cook till they set. Then place the mushrooms on them, on one half, and fold the other half over. Serve at once on a very hot dish, with hot plates. If wished, add to mushrooms a sprinkling of finely chopped savoury herbs.—**Mrs. A.M. (Wanganui).**

MUSHROOM SOUFFLE.

Three or four eggs, 1 tablespoon butter, 1 tablespoon flour, ½ cup milk, mushrooms, seasoning. Make a sauce of the butter, flour and milk. Peel mushrooms (chop if there are not many). Cool sauce and add the beaten yolks of eggs, stir in mushrooms and seasoning, then add the well beaten whites. Turn into buttered dish and bake in a good oven for 30 minutes; serve at once.—**Mrs. J. M. (Waimate).**

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Ranginui Farm, Puhinui Rd.,
PAPATOETOE,
5th February, 1941.

Mr. A. S. Bevin,
AUCKLAND, C.1.

Dear Sir,—I have long wanted to write you about your "Bevin" harrows which I bought in January, 1937. The harrows, **which replaced a heavy set of good tripod and chains,** have been used each year, and after four years' use I can quite confidently say the farm has benefited and I have no intention of ceasing to use them for many more years.

There is no doubt that artificial fertiliser can be saved; personally I find the most economical way is to pull the harrows and topdresser together, spreading **only a bag of super to the acre, and THE HARROWS SUPPLY THE REST.** Previously **3 cwt. of slag or 3 cwt. super used to be used,** but on the reduction the 360 acres are producing just as much or perhaps more.

One noticeable feature which interests all farmers is the **general improvement in health of the stock.** I have breeding ewes and produce for the fat lamb market, and the **death rate is considerably lower,** while **the trouble** that used to be so prevalent on this farm **is reduced 100%, that is, footrot in sheep.** Five years ago **it was necessary to put the sheep through a footrot trough about every three weeks** and still have a lot of lame sheep. Now the trough **is never used** and both the scald and actual footrot germ have diminished astoundingly, certainly **due to the surface draining effect** of the harrows.

I have no hesitation in recommending this harrow to any farmer, **particularly now, when fertilisers are hard to come by,**

Yours faithfully,
(Sgd.) D. T. ROGERS.

P.S.—The two harrows purchased in 1938 for our "South Head" property have likewise met with much approval. The rat-tail grass has diminished and the pastures have improved considerably.

A "BEVIN" WORKING ON MR. H. BREWSTER'S FARM AT WHANGARATA.

★ In a letter of 6/9/40, Mr. Brewster says:—

"I am very pleased with the "Bevin" Harrow I purchased September 22nd, 1939. It does great work. With paddocks that have become root-bound with brown top or paspalum, it works wonders, the rye and clover come away in fine style after once over with the harrow. The great thing is that your harrow **lifts up the under soil to the surface,** and this breaks down in a couple of weeks with the weather, and sort of **TOP-DRESSES THE GRASS WITH EARTH.** The photo which you have (illustrated above) of my harrow in action shows how the earth is stirred up."

"TOPDRESSES THE GRASS WITH EARTH." Surely this links up with Mr. Rogers' statement, "THE HARROWS SUPPLY THE REST."

"RANGINUI" is a highly developed property. It carries 1,250 breeding ewes; annually 1,500 lambs, of which 250 are bought in, are sold fat. There are also 300 fat cattle and 2,000 fat wethers produced each year.

"SOUTH HEAD" is a coastal run of 6,000 acres, of which only 1,400 are "Bevin" harrowed. This property carries 6,000 sheep and 1,200 cattle.

It is superfluous to mention that many neighbouring farmers both at "Ranginui" and "South Head" are now using "Bevins."

Now, four years ago, Mr. Rogers paid £17 for an 8 ft. set of "Bevin" Harrows for "Ranginui" (and incidentally, the price is still the same). What has he got for his £17 investment? Already for four years he has saved 1½ cwt. of artificial fertiliser per acre. This makes a total of 96 tons, or **over £450.**

Don't you think the "Bevin" was a good investment for Mr. Rogers? But hold on—the saving of £450 on his manure costs is only one advantage he got. We think you will agree that the elimination of the footrot and the raising of the percentage of lambs **would be worth,** on a very conservative estimate, **at least as much as the manure saving.** Not having to put the sheep through the footrot trough every three weeks has saved a tremendous amount of labour, and inconvenience to the sheep.

If you look at the accompanying illustration, you will appreciate that the definite, continuous cuts of the "Bevin" will let surface water (and incidentally fertiliser) into the soil where it is wanted. The "Bevin" is the only harrow which has a positive surface-draining effect.

Mr. Rogers, who is a very progressive farmer, realised that it was too much to expect fertiliser manufacturers to conduct experiments to find out the minimum amount of fertiliser really necessary, as their business is to increase their sales of artificials. He was also aware that the Government has never conducted trials of fertilising in conjunction with a good penetrating harrow, to ascertain the quantity of fertiliser that could be saved thereby. So Mr. Rogers experimented for himself, and he, like hundreds of other "Bevin" harrow users, found a great saving could be made. Possibly he did not expect his stock to benefit in health, but really there is a very simple explanation for this.

The surface draining is a common-sense way of preventing footrot and is much preferable to the foot-bath solutions compounded by our scientific friends as a cure. Birth mortality in stock, like most other stock ailments, is constitutional, brought about by deficiency of, for instance, Vitamin B in the feed. Scientists have been unable to find a substitute for Vitamin B to incorporate in their fertilisers. By letting in the beneficial rays of the sun, the "Bevin" harrow provides this, as a result of opening up the soil—which also admits air (oxygen) which invigorates the soil bacteria, thus promoting natural growth. Surely it is better to do this and have healthy stock, than to spend a lot of money on dope in an attempt to reconstitution the animals.

Well, now, even if manure were not a problem, even if past squandering did not necessitate our conserving overseas funds, which incidentally are further diminished by **excess** importations of fertiliser, doesn't the opportunity of bettering yourself financially interest you? Of course it does! So you will use this—

To A. S. BEVIN, Dept. J.,
38 Albert St. (Box 880), Auckland.

Without obligation, please send me fully Illustrated Catalogue, etc., of your Harrows, together with **a copy of your written guarantee of satisfaction to me, even to results, or money back.**

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..... J.A., 15/3/41

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